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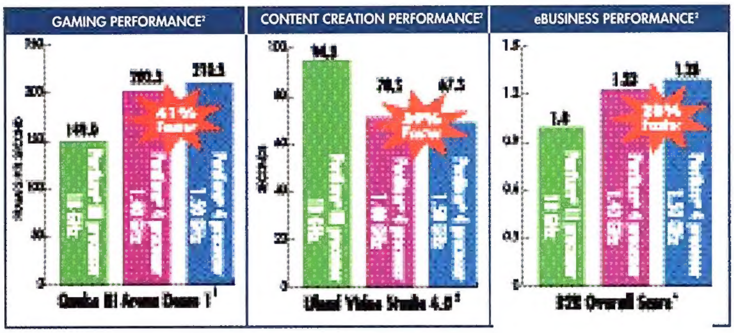

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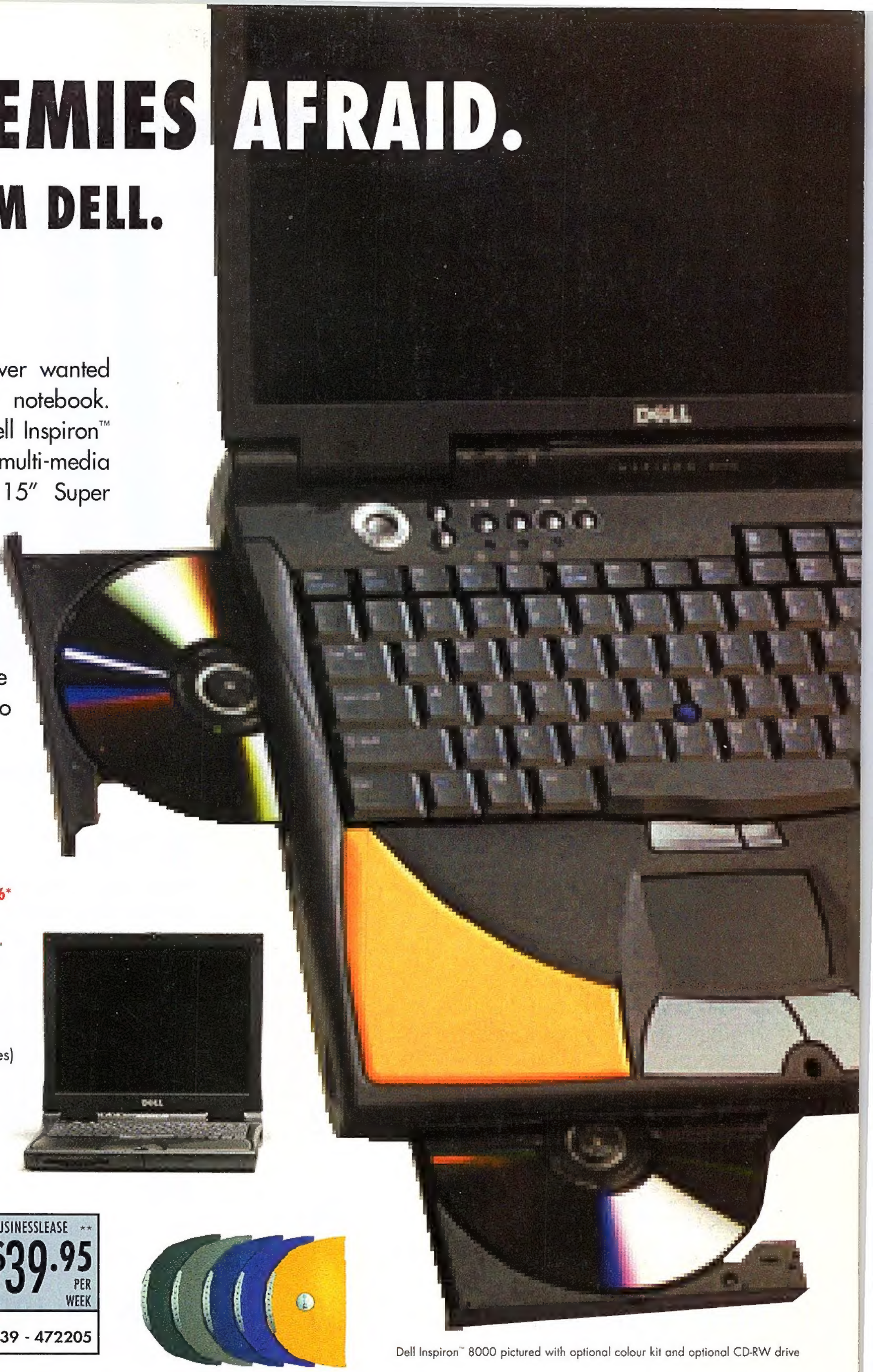

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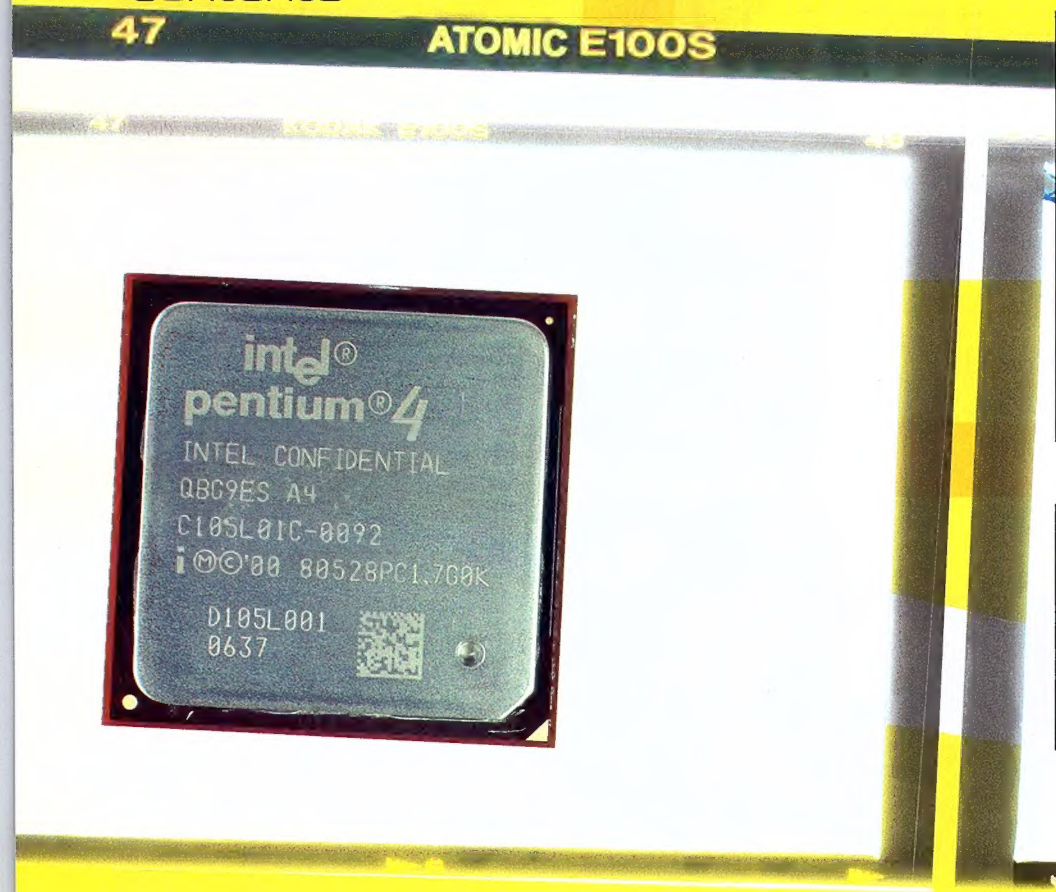

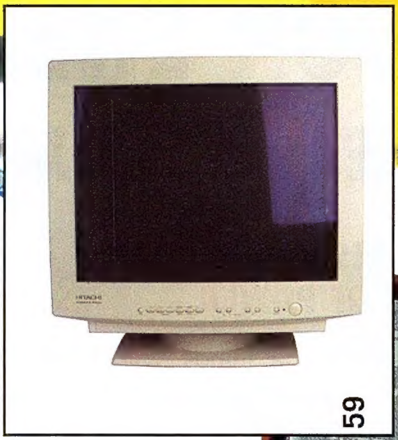
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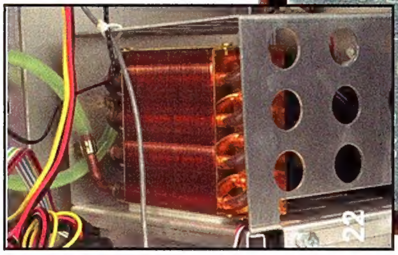
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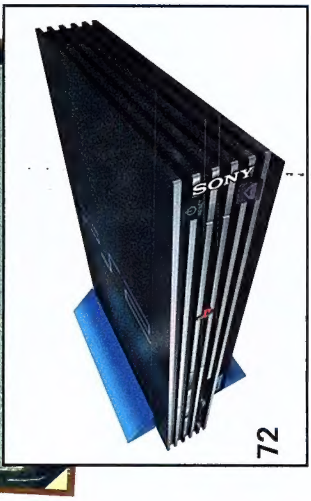

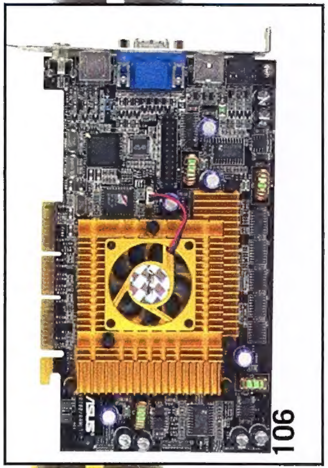

Another month of outstanding free booty lies within. Subscribe for your chance to pick up a PS2, Steering Wheel and Formula 1 2001 game on page 72. Come up with a cool name for Captain Atomic's sidekick and grab an Asus GeForce3 on page 106. Get help and win an atomic toolkit with I/O on page 74, or tell us what you think via Post Apocalypse on page 94 for the chance at a cool prize. Make us Ph34r your trivia skillz on page 93 for the chance to grab Tribes 2, a stackable USB hub or an Acclain E.N.G.A.G.E. game pack.

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XBoxed into the corner

Should we fear Xbox? Sony does, quite rightly, but will Microsoft's box have any effect upon our beloved PC?

Yes, it most certainly will. You all know that Xbox will hurt PS/2 because it's a developer's dream. Better hardware, and more importantly an easier, friendlier and more familiar development environment. But that's the left corner, where the consoles fight for a specific games market. What about over here in PCland? Surely the effect on our domain will be minimal? I don't think so.

Initially, I was very concerned that the Xbox's similarity to PC hardware would threaten PC sales from a traditional standpoint. Plug in a mouse, keyboard and printer and install a word processor, browser and email client and suddenly kids have a powerful justification for Parent Money to go to the Xbox instead of a PC. Microsoft assures us that this will never happen, that Xbox is a pure games machine. They stress that Xbox will be a closed system and no third-party can make this nightmare a reality. Given Microsoft's obvious reliance on the PC, I'm ready to believe that they are fiercely keen to protect their PC investment.

But what of the games? PC games have suffered enormously from pirates over the years. For most developers, investment in new projects, technology, staff and resources for existing projects is usually a set percentage of profits. So, less profit = fewer games and less time and effort spent on what does get released. It's bloody sad. It's also bloody irritating, as the most vocal complaints about the sad state of PC gaming seem to come from those that do the pirating. Hypocrites in denial. Anyone remember the 'outrage' over Quake III's CD Key? The god-given right to steal was taken away, oh the injustice!

Microsoft are as conscious of this as anyone and it doesn't take a particularly large brain to figure out why. A recent report from IDSA (Interactive Digital Software Association) estimated game piracy losses in the United States at US$3 billion for the year ending Dec 1999. By comparison, motor vehicle thefts cost industry US$766 million and Residential Burglary cost US$1.2 billion.

Obviously this explains why game prices haven't dropped – they've had to stay at $90 to maintain viability. It also explains why PC game releases haven't increased in line with the greater number of people playing them. Most worrying, though, is the likelihood of developers abandoning the PC in favour of a platform where more games are likely to be sold. That'd be Xbox.

Developers don't need to learn all-new skills to make Xbox games. So similar is the development environment that half-finished PC games can be switched to the Xbox. I am assuming, of course and I'm sure, rightly, that Microsoft will have implemented the tightest copy protection possible. Their plans will likely include shipping most games on DVD, which cannot yet be copied directly. Sony are already encouraging developers to ship games on DVD – even if the game software takes up but a fraction of the storage capacity. For pirates the challenge has never been greater. Most DVD games do have greater data than a CD, so pirates must rip to DivX ;-) then strip data (commonly reducing sound to mono, removing textures and/or levels) to make it fit. A modded PS/2 is needed too, and that scene hasn't got anywhere near the penetration of the original PlayStation mod scene.

Already the Matrix game has a six-month exclusivity deal for Xbox, Obi Wan from LucasArts has been changed from PC to Xbox, Halo we may as well give up on and Shiny has all but abandoned the PC. Next week will see more grim news, along with the week after and the week after that.

Props to those that buy their games. To those that persistently pirate: it's not a joke anymore, stop destroying that which you love so much and don't you dare cry about what's about to happen because it's all your fault.

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Short Circuits

In a first for home computing, the Xbox is to ship with a Dolby Interactive Content Encoder. Currently the use of Dolby Digital 5.1 effects within games has been limited to pre-recorded cut scenes, but the new technology within the Xbox enables real time use of this technique. For those who haven't heard a decent 5.1 setup, the difference between it and a quadraphonic setup is phenomenal. The technology uses a dedicated digital signalling processing unit within the Xbox Media Communications Processor, and hence no performance hit is expected when Dolby Digital 5.1 is in use. Yet another feature of the Xbox that is sure to be welcomed by gamers.

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In the wake of the mid air collision between a US spy plane and a Chinese passenger jet, hackers from both countries have been ramping up attacks. US hackers have been focusing upon Chinese Web sites, and Chinese hackers have been preying upon US sites. As the situation starts to cool on the diplomatic front, these Web site hacks are a growing phenomena in the continuing war of words. Whilst many Web site owners put the acts down to bunches of script kiddies, the FBI and National Infrastructure Protection centre have issued warnings to web site owners to be increasingly vigilant in the face of these attacks. We're just hoping that a small group of pasty, pimply h4x0r wannabes who know how to download someone else's hack don't cause the beginning of the end of the world as we know it.

Star Treknology: here and now

A mess of crazy Scots from St Andrews University in Scotland have just made one of the big geek dreams come true - they've perfected a working Tractor Beam. If you're not into the whole sci-fi thing, and think its the light that comes from a tractor's head lights, tractor beams are one of those staples of pulp, a beam that can trap an object and pull it closer to the beam's source. They've been used in Star Trek for all kinds of things, and even a Star Destroyer caught the Millennium Falcon in one in Star Wars.

There is a catch, however, so don't start plotting to use one to capture your very own armoured car. At the moment the beam can only work on small things. Real small, not like mice or beer bottles, we're talking molecular, so in theory it could be used to extract Senator Alston's brain. Two laser beams twist and refract to pull molecules into position, which is a boon for micro-biologists and any other scientists who work on the molecular level. Arranging such small particles is a lot easier if you don't have to actually touch them.

ⓘ Tractor Beams should revolutionise the great American Tractor Pull

The professors who have invented the device also think their tractor beam can be used in micro-industrial applications, as the driving engine for small, frictionless motors. And surely if you can tractor one molecule, you can upscale to tractoring lots of molecules. As soon as someone invents a warp drive, we'll let you know, but the pieces are certainly falling into place; and with George Dubya leading the United States back into a nuclear arms race we could even get that Third World War that's part of the Star Trek timeline. Keen!

Lawsuits and Profits

Over two years ago two disgruntled and much picked-upon school kids from Columbine High School went on an unprecedented shooting spree, killing teachers and classmates before turning their weapons on themselves. Now, gun scares are a near daily occurrence at schools across America, and the parents of those killed at Columbine believe they have found the culprit - the computer games industry. To that end, they are suing a number of leading games developers for a total of approximately $US5 billion.

25 companies have been targeted by the suit, including such giants as Sony Entertainment Corporation, Nintendo of America, AOL Time Warner and id Games. The 36 families of the Columbine victims have already milked $US2.5 million from the parents of the two teenage gunmen and the individuals responsible for providing the firearms in the first place. John de Camp, attorney representing the families, feels that the games are the prime reason that the two went on their rampage - The shooter Doom is particularly responsible, apparently.

Heaven forbid that anyone actually take the parents to task over the behaviour of their children, but I guess that's what the first $2.5 mil was all about. Numerous American film companies are also included in the lawsuit, due to violent movies, which also allegedly contributed to the massacre.

IBM ditches velvet

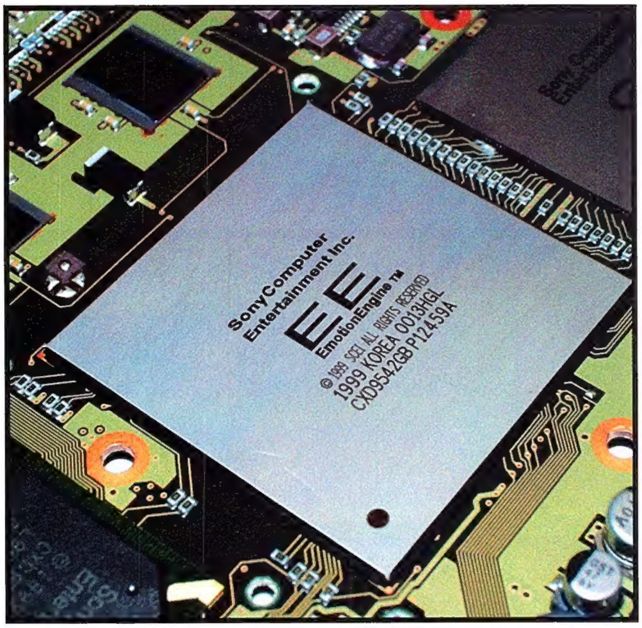
IBM researchers have come up with an improved method of manufacturing liquid crystal displays. Rather than the long used 'rubbing' method that has been employed in the manufacturing of these displays, IBM's new method is called atomic beam alignment. We agree that this is a fine name indeed.

The current process has only a slight degree of mad scientist about it. Screens are made by using a velvet cloth to rub a polymer substrate. When the liquid crystals are applied to this rubbed substrate they align in the direction of rubbing. This has several major drawbacks, most importantly the need for a clean room set aside separate from the rest of the manufacturing process and the high failure rate that occurs when the rubbing roller degrades and starts rubbing unevenly.

The process uses a non-contact method of alignment, using a low energy ion beam. This beam is fired on an oblique angle at amorphous inorganic films; in IBM's case the films are coated with a fine powder of diamond-like carbon. This can lead to the production of higher quality and higher reliability displays.

All this is pretty serious science and a major breakthrough in the field. Praveen Chaudhari, the lead scientist on the project even goes as far as calling it the Holy Grail of flat panel display manufacturing. Hopefully the days of the hulking CRT display are numbered due to their work.

PS2 chip to be used in online toasters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ⓘ No more fun and games for the Emotion Engine

The core of the Emotion Engine within the PS2 is the TX79 RISC Microprocessor, produced by Toshiba's San Jose-based microprocessor engineering division. Toshiba have announced that they have formed a subsidiary company that is to be solely responsible for the manufacture of chips based upon the architecture of the TX79, to be known as ArTile Microsystems , Inc. The revisions of the chip are planned for use within SOC (system on chip) applications such as digital set top boxes, digital TVs, multimedia appliances and networking applications. Obviously Toshiba have big plans for this chip, and after seeing some of the newer games that are due for release on the PS2 (GT3 and MGS2 to be specific) we're starting to grow fond of the hardware within the PS2. We keep imagining this chip in use in toasters with built-in LCD screens that allow you to play Metal Gear Solid 2 whilst waiting for your toast to brown.

ArTile believe that their scaleable design methodology will enable chips to be produced at up to 70 per cent faster than current techniques. Considering that the market these SOC microprocessors are aimed at is growing at around 27 per cent each year, reaching an estimated total value of US$61.5 Billion by the year 2004, making it one of the highest growth segments.

It looks as if this move could be a wise decision on Toshiba's behalf, because even if they don't make quite as much money on the hardware from PS2 sales due to the impact of the Xbox, they'll still have their bases covered.

Short Circuits

In a move that is bound to make Linux lovers of the world rejoice, Sony have announced an official port of Linux to the PS2. This was apparently prompted by a community petition, signed by over 6000 people. The kit's hardware comprises of an external hard disk drive, an Ethernet unit, a VGA adaptor as well as a USB keyboard and mouse. The software includes a complete Linux/X11 environment with all sources, technical hardware manuals for the Emotion Engine, GS and vectorunits plus a low level API and Mesa drivers for the graphics. Initially it will only ship to 1000 users in beta form, at a cost of around US$200.

In a moment of sheer brilliance in the atomic labs, we managed to get the world's highest 3DMark2001 score, which we held onto for over a week. Combining a P4 1.5GHz @ 1.6GHz, with 256MB of PC800 RDRAM and an Asus GeForce 3 (which was also overclocked as fast as it could be pushed), we were able to attain a score of 6,317.

Later in the week we ran got our mitts on a 1.7GHz P4. We managed to crank it up to 1.88GHz with the help of an FSB overclock and a few other tweaks. We ran the same test again, breaking the record with an Earth shattering score of 6,579.

Unfortunately we lost the title soon after to a P4 overclocked to 2GHz, but you can be sure we won't let this rest until we're back at number 1.

The atomic Web site has been going off like a frog in a sock of late, with a new high of around 20,000 hits per day. The majority of these were to our forums, so come and join in the fun and experience the bliss that is the atomic family.

Intel makes fast CPUs and cures cancer

So you've left SETI@home churning over on your PC for the last year and still haven't discovered any extraterrestrial life forms yet? If you're losing patience with trying to discover where ET phoned home to, you might want to choose the slightly simpler task of saving humanity itself.

Intel have begun a program called the Intel® Philanthropic Peer-to-Peer program, which utilises the same technique of distributed computing that the SETI@home project uses. In case you're not sure of how this works, here's a brief run down: a centralised computer distributes individual packets of data to thousands of computers via the Internet.

Whenever one of these PCs becomes idle or is only using a fraction of its system resources, a program on each PC starts processing its data packets. When it has finished processing its allotted data, the results are sent back to the central computer. By doing this, vast amounts of computing power that would otherwise be sitting unused and idle are available for free to the developers of the software.

While the SETI@home project processes incoming radio signals from space, looking for patterns that could signify an intelligent source, the Intel Philanthropic Peer-to-Peer program has a slightly more down to Earth, and perhaps realistic, ambition.

The first of these is the United Devices cancer research program, which is a drug optimisation program focusing on improved drug treatments, with the holy grail of a cure for Leukemia as the final target. Further programs will centre on diseases such as Cancer, Diabetes and Parkinson's.

In fact, any medical science that could benefit by this technique will most likely get a run on Intel's vast 'virtual supercomputer'.

This poses an interesting problem. Who has the rights to the information that is discovered? Knowing how cut-throat the pharmaceutical industry is, we expect that whoever develops the software for each project will reap the benefits of the results.

So why should home users feel the need to help find cures for diseases at no charge, that will inevitably make some mega corporation even richer than it currently is? Perhaps a system whereby profits are distributed amongst users, directly in proportion to how much data processing they did, will be necessary in future.

In which case, Distributed Computing groups, such as the atomic SETI@home group, could become great money making ventures for people with powerful PCs. Imagine the incentive to upgrade if you knew you could make more money as a direct result. Ahhh, at last, a totally justifiable home PC upgrade.

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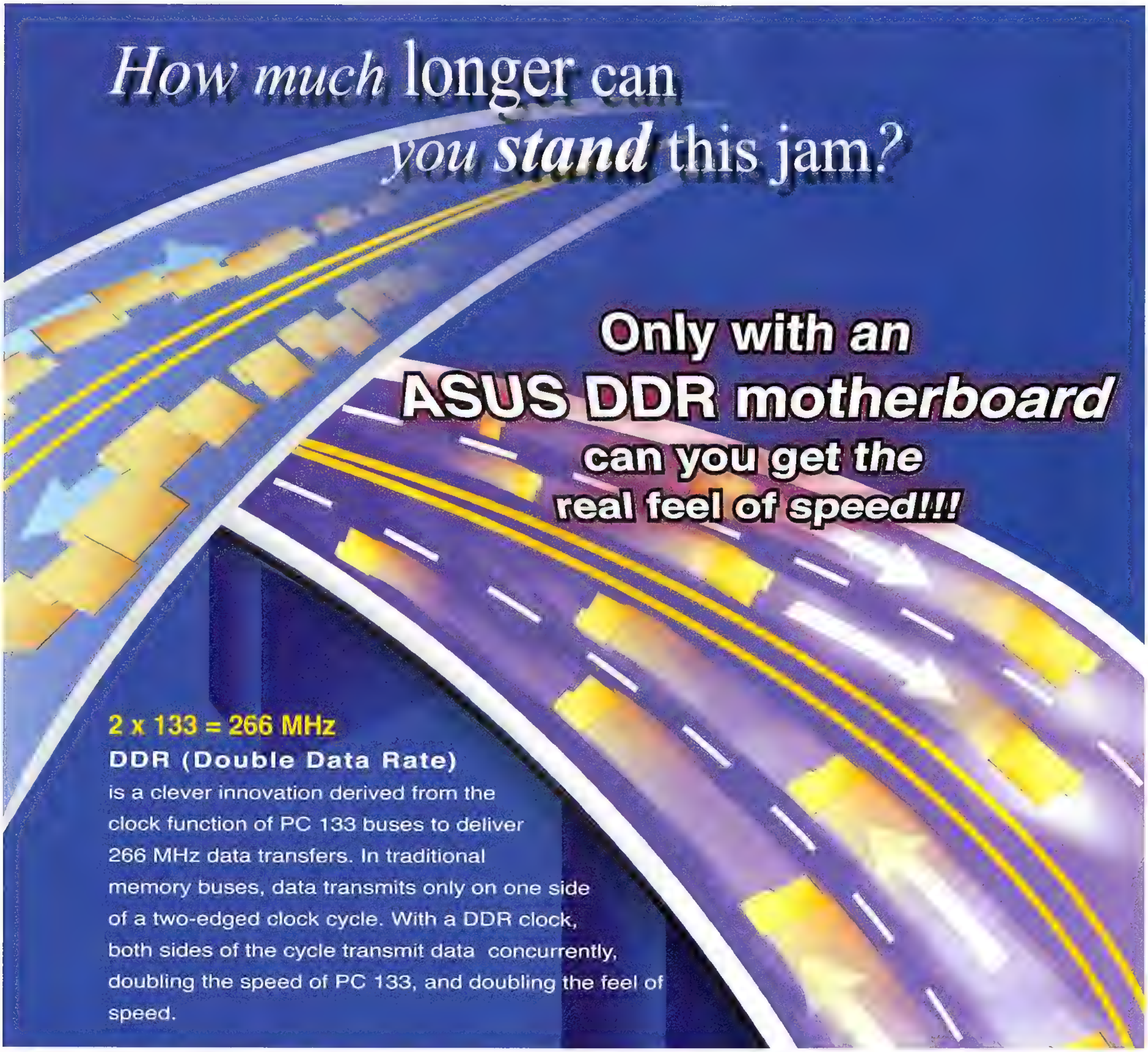
Tribes 2 The complete online shooter	**CounterStrike** Reinventing the cheat
FireWire Finally finding friends outside Apple	**Hi-Speed USB** Bill still hasn't forgiven USB
Femtosecond Faster than an AMD price cut	**Picosecond** Are we there yet?
Cable Broadband at its best	**ADSL** Overclocked dialup
Old Skool Kickin' it	**New School** Giving it a stern warning

Short Circuits

The ongoing Infineon vs Rambus scrap has been all but thrown out of court. The US court dismissed 54 of the alleged 57 patent infringements by Infineon. To add insult to injury Judge Payne (no relation to Max) has stated that even if Rambus proved that Infineon had violated the other three patents he would find that it was done unintentionally. Rambus has alleged that Infineon had systematically ripped off patented ideas after negotiations between the two companies in the early 1990's. This decision should have widespread ramifications for an industry that has been living under a cloud of litigation, mostly stemming from Rambus and its belief that memory technologies such as DDR are in some way based upon their patents.

Hot on the heels of the news about the death of the open source linux console, Indrema, comes word of a new console known as the TuxBox. TuxBox is a decidedly low end, low-tech solution to the console race, using an AMD Duron 750MHz processor and a GeForce2 MX with TV-Out as the heart of the system. The failure of Indrema has was blamed upon the general lack of support for the open source console idea and there are big doubts as to whether the much more underground TuxBox can make it further than the bigger budget flop of Indrema.

The new leaked NVIDIA detonator 12 series of drivers supposedly offer a huge performance boost to users of the Pentium 4. W2K users should also notice a significant performance increase with these drivers. Unfortunately we can't vouch for the stability of this set.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2 x 133 = 266 MHz

DDR (Double Data Rate)

is a clever innovation derived from the clock function of PC 133 buses to deliver 266 MHz data transfers. In traditional memory buses, data transmits only on one side of a two-edged clock cycle. With a DDR clock, both sides of the cycle transmit data concurrently, doubling the speed of PC 133, and doubling the feel of speed.

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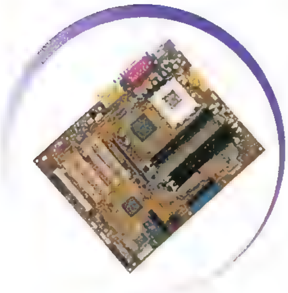
with DDR and SDR DIMM sockets, the ASUS DDR motherboards are extremely flexible, scalable and cost-effective



AMD DDR Solution

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- *ALi M1647 Chipset*
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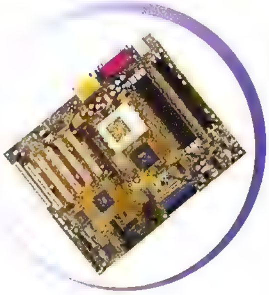
- *3 x SDRAM DIMM(PC133) for 3GB Maximum*
- *AGP Pro(AGP4X Compatible) Slot for Graphics*
- *Dual Channel ATA100 IDE*
- *C-Media 4-Channel Audio(optional)*
- *4 x PCI, 1 x AMR/PCI Shared*
- *ASUS iPanel Family Support*



Intel DDR Solution

CUV266-E

***3 DDR* SDRAM DIMMs plus *2 SDRAM* DIMMs**

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- *VIA VT8633 Chipset*
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- *2 x SDRAM DIMM(PC133) for 2GB Maximum*
- *AGP Pro(AGP4X Compatible) Slot for Graphics*
- *Dual Channel ATA100 IDE & Raid 0, 1*
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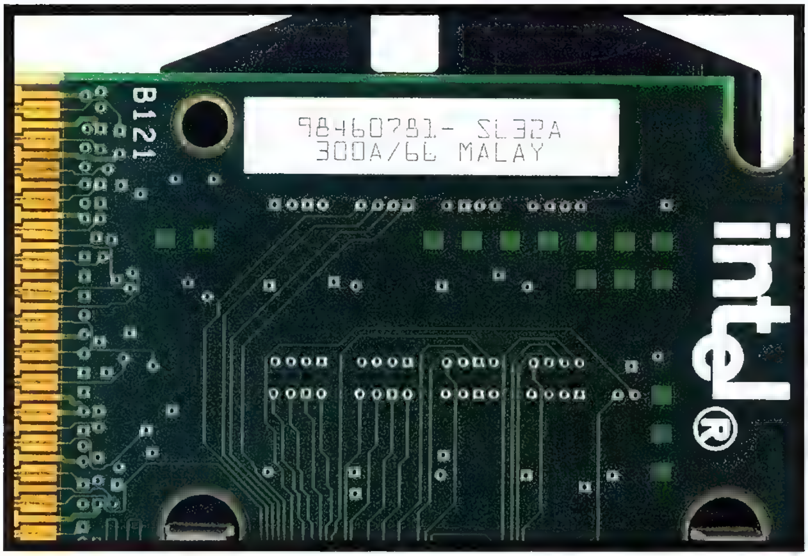
Overclockers: Get in early!

Buying new release gear can be smart in the long run for overclocked MHz milage, according to Dan Rutter



The legendary Celeron 300A, a classic example of an early release with a ton of overhead, most would easily do 450MHz, making the 300A the clever shopper's choice CPU

Last month, I mentioned the less obvious reason to hold off on buying new and exciting computer gear as long as you can stand. Not only does everything get cheaper all the time, but people who buy later can also find themselves getting better, updated versions of the processor, video card or what-have-you. Pay less - get more. What's not to like?

> **"Some people are into overclocking just for the PC-salon tweakiness of it, of course."**

There's an exception to this rule, though. One sector of the market finds later, improved, higher-capacity versions of products steadily less and less interesting as they get faster and faster. That market sector is the overclockers.

When you want to run a CPU faster than stock, the best chip to buy is, generally speaking, one of the early models released right after a new flavour of processor comes out. Not after the release of a whole new CPU, necessarily - just an updated core for an existing chip will do, like the "Coppermine" core for the Pentium III or the "Thunderbird" Athlon. The upcoming "Palomino" Athlon core should work the same way, and create another overclockers' feeding frenzy.

The reason for this is that new CPU models tend to have considerably more core speed headroom than well-developed, thoroughly speed-bumped models. Late model chips can often be thought of as "overclocked by design"; the manufacturers have already wrung most of the juice out of the core.

Earlier models may run fine at higher speeds, but need too much cooling at that speed, to be a mass-market product. Early model cores commonly aren't consistent - some can manage a high speed, some can't, and they all get packaged with a speed rating they're sure to comfortably handle.

This is all just part of the overclocking adventure.

You may need to crank up the core voltage and you'll probably need considerably more than stock cooling to get 30 to 50 per cent more speed out of a new-model CPU. But you're much more likely to be able to do this sort of thing with the first model of a line of CPUs than with the last one.

Take the Pentium II-based Celerons, for instance. The original 300MHz no-cache Deschutes version and the "300A" Mendocino model were famous for having about a four out of five chance of running perfectly happily at 100MHz Front Side Bus (FSB), instead of their stock 66MHz. Which made them into 450MHz processors.

The Mendocino Celeron at 450MHz was the equal of the 450MHz Pentium II, which was the fastest P-II ever made, and far more expensive. Overclocked Celerons were, at the time, spectacular value for money.

As the Mendocino product line developed, though, the overclocking prospects got less and less exciting. The likely ceiling core speed for an air-cooled Mendocino is about 550MHz; some do noticeably better, but it's not the way to bet. If the stock speed's 466MHz, a seven per cent overclock to 550 is not exactly a performance-hound's dream come true.

The same sort of thing applies, as I write this, to Athlons. Athlons running at 1GHz and faster aren't exciting overclockers, at least not without some very serious active cooling.

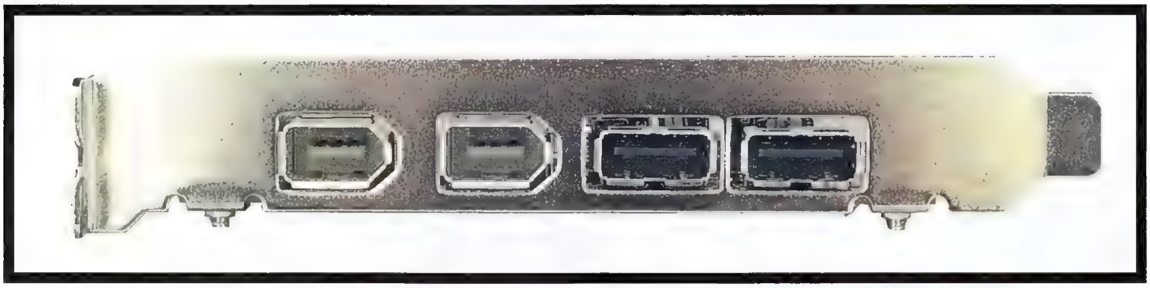
A decent number of older 700MHz Thunderbird Athlons can be wound up to 1GHz without enormous trouble, but getting a 1GHz one up to 1.4GHz is a lot more challenging. It makes more sense to save up for a 1.2 or 1.33GHz Athlon off the shelf than it does to buy fancy overclocking gear and try to goose your older Athlon up to that sort of speed.

Some people are into overclocking just for the PC-salon tweakiness of it, of course. Water pipes. Peltiers. Lots of fans, neon lights, case windows with faux etched-glass appliqués and fluffy dice hanging somewhere.

Value for money be damned. If you're in it to get speed on the cheap, though, pick your processor with care.

Hi-Speed USB

David Petersen examines the latest in high speed ports



The Belkin USB/FireWire combo card. The two ports on the left are IEEE1394 ports, the two on the right are for the now familiar USB 1.1

One of the new technologies that will start to make an impact this year is the next generation of USB (Universal Serial Bus) devices. The specifications for Hi-Speed USB, or USB 2.0, was standardised almost two years ago and is being implemented by manufacturers such as Compaq, HP, Intel, NEC and Microsoft.

USB 1 and 1.1 is 100 times faster than RS232 serial and Hi-Speed USB will be 40 times faster than USB 1.1 and will rival that of SCSI (Small Computer System Interface) and IEEE1394, more commonly known as FireWire, iLink or DV. Hi-Speed USB will look and work the same as USB and will be backward compatible.

Apart from the high-bandwidth provided, it can be added to systems with very little impact on overall production costs to the manufacturer.

To keep their costs down some products will never adapt the Hi-Speed USB. HIDs (human interface devices) such as mice, keyboards and joypads do not need such high-bandwidth but devices such as high resolution scanners, digital cameras and MP3 players can make good use of the extra data throughput that Hi-Speed USB provides.

The higher data rate of Hi-Speed USB will also open up the possibilities of new and exciting peripherals and will allow multiple high-speed peripherals to work on the same bus.

IEEE1394 has the advantage of being iso-synchonous, meaning it can continuously transfer a steady preset speed without any supervision from the host. This makes IEEE1394 ideal for streaming video. IEEE1394 is expected to replace IDE, SCSI and eventually EIDE.

It's also interesting to note that not all IEEE1394 devices are interchangeable. Simply because there is a DV connection does not mean it will support FireWire. Because IEEE1394 is peer-to-peer it is possible to connect two camcorders together and dub from one to the other without needing to be connected to a PC.

Medium	Speed	No devices per port
Serial	115Kbits/s	1
USB 1.1	1.5-12Mbits/s	127
USB 2	1.5-480Mbits/s	127
IEEE1394	100-400Mbits/s	63

The Hi-Speed USB and IEEE1394 differ in application focus. Hi-Speed USB is not designed to replace IEEE1394 and will co-exist on the same PC, much the same way as they do now. IEEE1394 still has its place for DV devices and hard drive connectivity; however, we may see some cross-pollination with devices available on more than one medium.

The first devices to take advantage of Hi-Speed USB will be CD-RWs, hard drives, DVDs, scanners and printers. IEEE1394 is already the dominant connector for camcorders, digital VCRs, DVDs and digital televisions and it is unlikely that Hi-Speed USB will make any change in the near future with the way these products connect to the PC or Macintosh computer.

Existing USB 1.1 hubs will not be able to carry the extra bandwidth and will need replacing to be USB 2.0 compliant, however, new USB 2.0 hubs will support both USB 2.0 and 1.1. All existing USB products will work with USB 2.0 hubs and will support low speed 1.5Mbps bandwidth devices such as mice, keyboards and game controllers.

Products using the USB 2.0 will display a blue, white and red logo bearing the words "certified" and "Hi-Speed". Other devices that do not carry the extra speed may have an identical logo except for the absence of the "Hi-Speed" banner.

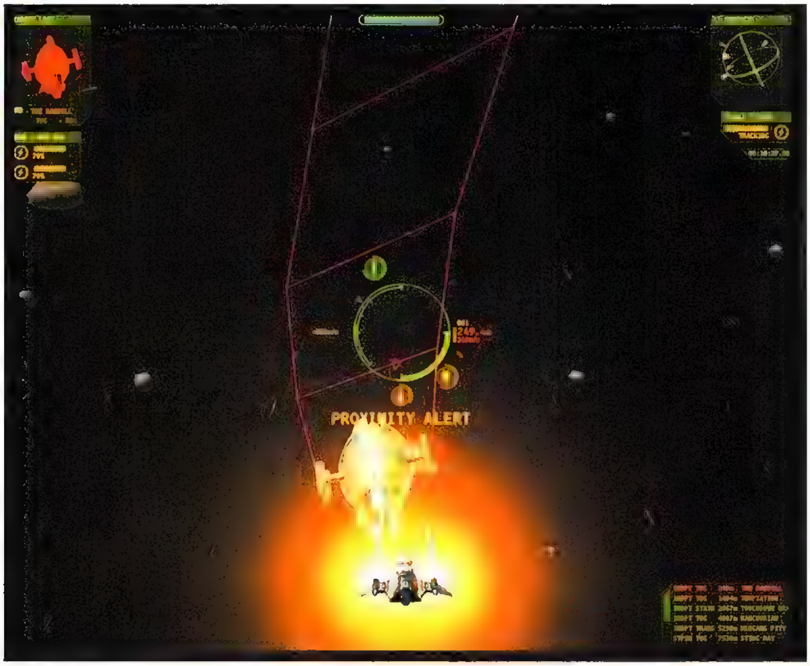
Hi-Speed USB has recently suffered a major setback, with the revelation that it will not be supported in Windows XP. The full implications of this decision will be unknown for some time, but it will cause hardware manufacturers to rethink their plans.

Add-in cards should be available by the time this article goes to print. Some manufacturers, such as OrangeLink+ have cards with both Hi-Speed USB and IEEE1394 on the same board. Other manufacturers, such as Belkin, also have Hi-Speed USB hubs and cards.

Web site: www.usb.org

I-War 2: Edge of Chaos

George Soropos beta tests the Next Great Space Sim



A rather slick HUD with nothing but useful information, away with fluff in HUDs we at atomic say!

The first I-War saga was a serious affair. Civil war, piracy, and even the occasional appearance by the President. The usual course of action for a sequel would have been to create some pan Galactic threat, even bigger than the one before, and maybe throw in a few boggle eyed aliens for good measure. Preferably ones that represent the greatest evil man has ever faced since the Dawn O' Time.

Particle Systems have instead chosen a different approach for I-War 2, continuing the story at a more personal level with the main character in the new story being a young orphan named Cal. Fans of the original game may find this a bit hard to take at first, particularly as the intro sequence doesn't quite have the same impact as the superb, and still the best ever, intro from the first I-War. It looks a bit more like the opening scenes of a new Disney movie than I-War, but it certainly is a departure from what many would have expected.

Not wanting to give too much away the new saga follows Cal's adventures after finding out that his Grandma was a pirate of sorts who had her own base not far from where Cal lives with his Dad. After certain events, and gangsters, conspire to blow Cal's father into his constituent particles, our old friend Clay makes an appearance. It turns out Cal's father had used Clay on his own ship and had left him/it to look after his son. Now there's just the small matter of revenge.

Whether you like the idea or not this approach certainly seems to work. The whole feel of I-War 2 is very different from the original, but there are other reasons for that as well.

Particle Systems have made some clever changes to the way the HUD shows the player useful information. A new branching menu system controlled by the hat switch on your 'stick makes practically every function of your vessel available with no more than three flicks of your thumb. Of course there are still key controls for these functions but many are easier to use with the hat activated menus though at times it would have been nice to be able to use the hat to look around outside the ship.

Another key difference between the two games is in what happens between missions. I-War 2 allows for RPG-like conversations between your character and a host of others scattered around the gameworld, which help roll the story along or get you side missions and jobs to earn upgrades.

Upgrades are available from your own base if you've bought or found them adrift, or from lonely space traders easily enticed into having a few moments alone with your pert, perky 12-year-old bottom in exchange for a few parts. Or they just might accept credits if you're lucky.

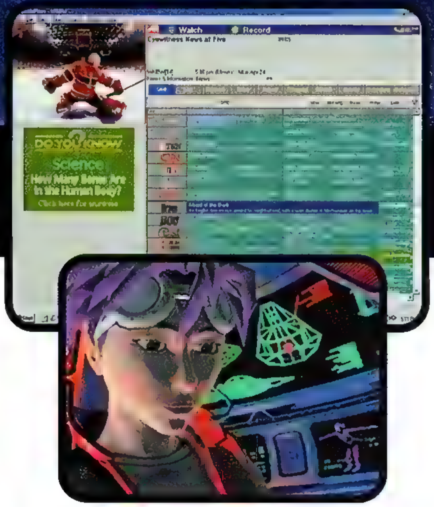
Of course another way to acquire items is through piracy, it is a family tradition after all. By flying close to cargo ships and frightening them a little you can make them drop their cargo. You won't be able to carry the cargo pods on your own but you can call in your old mate Jaffs and his Search and Recovery vehicle to cart them back to your base.

The combat and flight mechanics of the game are largely untouched on the surface and in combat, the game plays almost identically, except for the improvements allowed by the new HUD, to the first. There are a few new weapons that also give you some scope for new tactics though good old fighter plane tactics will see you through most battles. There is also a welcome change to the size of your areas of operations with the systems you can move around in during individual missions being a lot bigger than those in the original title.

It's always a long time between drinks for space shooter fans these days so I-War 2 should be hotly anticipated, and deservedly so. I-War is still one of the best space shooters ever and the sequel looks good enough to keep that reputation alive.

GAME DETAILS

Developer: Particle Systems
Publisher: Infogrammes www.infogrammes.com
Distributor: Infogrammes www.infogrammes.com
Release Date: 3rd QTR



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Short Circuits

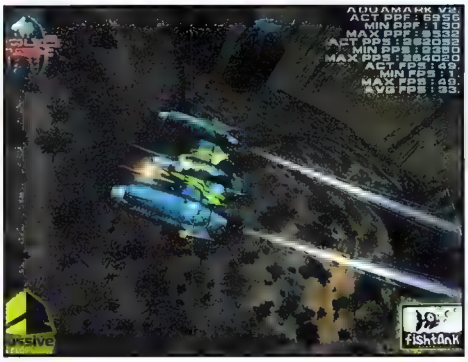
Coca Cola's quest for world domination is now one step closer to reality, courtesy of the distribution of seventeen clandestine Cyborg Coke Dispensing Warriors in Sydney's Central Train Station. These self aware units enable the users of certain Telstra mobile accounts to simply dial a number that is displayed on the machine to get their drink of choice – Coke, Coke or, surprisingly, Coke. After dialling the number, the user's account is automatically debited the amount of the drink and, using the wonders of the Internet, the machine is ordered to dispense said drink. The folks responsible for this insidious scheme are planning on extending the service to cover parking and eventually other general shopping items. Before we know it we'll be using our phone bills in the same way as credit card accounts, and due to half the nation using mobile phones, that's one shentload of credit that will no doubt cripple our nation. When this happens, expect the Coke bottle shaped heavy bombers to start taking out our national defence infrastructure.

Microsoft's Web sites have been hit hard by hackers over the last week. A total of nine defacements of different MS websites, including the UK, Saudi Arabia, Mexico, Brazil and Slovenia, were defaced by a group known as Prime Suspectz. Most of these weren't major hacks, but nonetheless they were infiltrated. Isn't it great to see that the world's number one supplier of home PC operating systems can't even develop a secure web page? If they can't manage this, how on Earth do they expect to make a secure operating system?

Underwater love

Last month we talked about the new 3DMark2001 Pro benchmark from MadOnion, which is the first of the DirectX 8-optimised benchmarks to arrive in the atomic Labs. This month we received our copy of a special release of AquaMark, which is a rolling-demo benchmark based on the upcoming game, AquaNox, from German developer Massive. Its peculiarly-named krass-Engine incorporates many of the advanced features in DirectX 8, such as the Vertex and Pixel Shaders as well as multiple levels of FSAA (Full Scene Anti Aliasing). Although AquaMark was originally developed by Massive as a stress-test both for hardware and drivers, as well as for the engine itself, it serves well as a benchmark for DirectX 8-enabled cards, which at the moment basically means the GeForce3.

The settings for AquaMark allow for a broad range of resolutions and colour depths, from 640 x 400 at 16-bit all the way out to 1,920 x 1,200 at 32-bit, with textures from 8MB to 40MB, and with FSAA options allowing 2x, 3x and 4x sampling. The demo itself runs you through some funky underwater scenes with high-tech submarines ducking and weaving. At the moment we are just waiting on some kind of competition to the GeForce3 before we can really get the most from AquaMark, although in the meantime it will be handy for comparing amongst the different manufacturer's GeForce3s. www.massive.de



ⓘ Underwater action with Massive's AquaMark.

Virtually Fast

There has been much talk of memory latency over the past few months, especially in the perennial SDRAM or DDR RAM versus RDRAM argument. The reason that RAM latency has come to the forefront as a performance issue is that it has become vividly apparent that memory speed is not only an factor of frequency and bandwidth. For example, PC800 RDRAM runs at 400MHz DDR with a 16-bit data path, giving an overall bandwidth of 1.6GB/sec, while PC133 runs at 133MHz with a 64-bit data path giving an overall bandwidth of 1.064GB/sec. The thing is that by design RDRAM, in many circumstances, has a greater latency than SDRAM, meaning that RDRAM is actually not the 60 per cent faster than PC133 that its specification would seem to imply.

DDR RAM can also be deceiving for the same reason. The 'double data rate' refers to the fact that DDR RAM effectively has half the latency of conventional SDR RAM when performing burst transfers, although the precharge latency is still similar to SDR RAM. When reading just a small amount of data, DDR RAM can in some cases even be slower than SDRAM, and it only takes the lead when it comes to large burst transfers.

One way to reduce the latencies inherent in SDRAM is with NEC's Virtual Channel Memory (VCM). The idea behind VCM is to remove the latency involved in searching for the registers of some data and in precharging a page of memory to get it ready for transfer. VCM features a set of 'virtual channels' that act like a cache for page addresses for a particular memory block, allowing data to be accessed quicker, even while another page is precharging for the next transfer. This means that in cases where large amounts of data need to be read consecutively, VCM RAM can give a significant performance boost. It's not all sunshine and lollypops, however, since just loading the addresses into the channel takes an extra cycle, meaning that it can be slower than SDRAM when accessing lots of small amounts of data from many pages. Also, if there is a page miss, such as in the result of a misprediction, then flushing the channels can cause a significant delay. VCM RAM also requires an advanced memory controller and a greater number of transistors than regular SDRAM chips, even though it is pin-compatible with standard SDRAM DIMMs. Furthermore, we'll be buggered if we can actually find any VCM RAM in any retailers in Australia. Given its higher cost than SDRAM, and its relatively small performance boost, especially in the face of DDR RAM, it is not likely to become terribly prolific either. Just thought we'd let you know what the hell it is anyway...

Get your 4in1s

We get a lot of technical enquiries here relating to performance issues that people have with their VIA chipset-based systems. If you own any motherboard with a VIA chipset, such as an Apollo Pro133, KX133 or KT133, you must make sure that you have the latest VIA 4in1 drivers installed. The most important component is the AGP driver, and without it you can expect your 3D performance to be around half what it should be. The latest 4in1 drivers also fix an annoying bug that occurs when you use an ATA/66 or ATA/100 drive with your Athlon and a Creative SoundBlaster Live! card which can potentially corrupt data on your hard drive. So if you are looking to get the most out of your VIA chipset motherboard, then make sure you head over to VIA right away and get downloading.
www.via.com.tw

Cryptic Chips

Yes, there is method to the madness, or so we hear. It might look like the product codes on a CPU come from an Enigma machine, and you either need the brain of someone like Turing, or just a bloody long slid rule to figure them out, but there is a pattern. Its always useful to have a quick roundup of the codes on the latest Athlon, and Duron processors, to give you a little insight into what they mean, and save you the time and hassle of digging through arcane technical white papers and PDFs just to find out whether you really do have a 800MHz chip, or whether you have been gipped.

AMD ATHLON 'CLASSIC'

AMD-K7 750 M T R 5 2 B A

AMD-K7	Family/architecture: AMD-K7
750	Speed: 550MHz-950MHz, 100 = 1,000MHz
M	Package type: M = Card Module, P = PGA
T	Operating voltage: T = 1.6V, P = 1.7V, N = 1.8V
R	Case temperature: R = 70°C
5	Size of ext. cache: 5 = 512KB, 1 = 1MB, 2 = 2MB
2	Cache divisor: 1 = 2:1, 2 = 2.5:1, 3 = 3:1
B	Max FSB: B = 200 MHz
A	Reserved

AMD ATHLON 'THUNDERBIRD'

A 1333 A M S 3 C

A	Family/architecture: A = AMD Athlon model 4
1333	Speed: 850MHz, 900MHz, 1,000MHz, 1,100MHz, 1,133MHz, 1,200MHz, 1,300MHz, 1,333 MHz etc
A	Package type: A = PGA
M	Operating voltage: M = 1.75V, P = 1.7V
S	Case temperature: S = 95°C, T = 90°C
3	Size of L2 cache: 3 = 256KB
C	Max FSB: B = 200 MHz, C = 266MHz

AMD DURON

D 900 A U T 1 B

D	Family/architecture: D = AMD Duron model 3
900	Speed: 600MHz, 650MHz, 700MHz, 750MHz, 800MHz, 850MHz, 900MHz, etc
A	Package type: A = PGA
U	Operating voltage: U = 1.6V
T	Case temperature: T=90°C
1	Size of L2 cache: 1=64KB
B	Max FSB: B = 200MHz

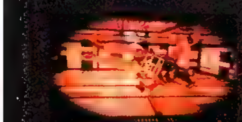
Short Circuits

The show isn't over until the fat lady sings, or until the code monkeys stop creating new stuff. Development of new titles for the Dreamcast are to cease at the end of March 2002. Although this news is saddening given our love for the Dreamcast, at least there are still 65 Dreamcast titles in development. However, don't be surprised if many of these are cancelled, as the PS2, Xbox and Gamecube become the focus of many developer's attention over the coming year. Goodbye Dreamcast old chum, you served us well...

We've been playing around with the GeForce3 lately, and have encountered what seems to be a major problem. On two seperate computers, after switching to or from the GeForce3, registry errors were encountered, requiring a reinstall of the OS. Hopefully this will be fixed with the release of official drivers.

Short Circuits

Remember those clear glass slides that had to be removed from HAL in 2001 to stop its murderous killing spree? Well it seems that the idea of storing information within the medium of glass isn't as fanciful as it looks. A group of scientists in Japan from Kyoto University and Central Glass Co, Ltd have almost finished their preliminary assessment and testing of a technology, which utilises a femtosecond laser beam combined with glass. A femtosecond laser is able to irradiate the glass for an extremely short period of time – around one/1000 trillionth of a second. Using a prototype of the technology, the scientists successfully stored eight terrabits of data on a 1cm cubed glass cube. Due to the success of their tests, the team have announced that a commercially available version of the technology will enter development by the end of year. We can just imagine how cool future PCs might look using a row of glass cubes for its storage requirements.



Dell is red-faced and recalling nearly 300,000 notebook batteries after it was found that the faulty units were overheating. And we ain't talking 'Ooh my lap is a little hot', but instead 'For the love of God my crotch is on fire!'. Yep, they're actually bursting into flames. In other laptop shortcomings, the new Apple Titanium notebook is causing trouble at some airports, because the Titanium alloy used looks the same as explosive material to certain airport bomb scanners. Oops!

C3: Judgement Day

Judges Judy and Dread were too gutless to turn up for the Australian VIA C3 launch. Atomic were there.

Occasionally the job of computer journalist takes you far abroad to experience new sights and get involved in exotic and mysterious rituals. In this case the atomic crew found themselves in sunny Marsfield, in Sydney, at Curzon Hall for the Australian launch of the VIA C3 processor and promotional night for DDR RAM. We weren't only there in our usual capacity as computer journalists, however (which is generally accepted as being the cynical bunch in whichever corner is frequented most by the snack-bearing waiters, consuming all the alcohol and arguing the merits of CL2 SDRAM compared to the spinfusor in Tribes 2). As a part of the nights proceedings, VIA Australia had invited some of Australia's top PC assemblers to show off the latest VIA hardware by putting together systems using DDR RAM and some with the new C3 processor. The DDR systems had no price cap and were packed to the rafters with some of the funkiest peripherals around, including water cooling, neon lights, mega sound systems and some serious monitors. The C3 systems all came under $1,000 and were fully-featured PCs, impressive indeed given their low price point.

Our task was to benchmark the bejesus out of these systems to find who would be the recipients of VIA's special awards for the night. And benchmark we did. Given the nature of the roundup, and the fact that we had a dozen machines to test in the space of a few hours, we had to use a trimmed down version of our usual extensive PC testing benchmark bundle. What we were left with was a package of tests that pushed all the systems to their limit and gave some interesting results. For the DDR systems we used the Sandra CPU, memory and I/O tests, specifically to isolate these particular sub-systems and to show the benefit of the SCSI and RAID hard disks that were in a couple of the machines. We also used Quake III Arena, although instead of using our usual atomicmpc killer demo, we used a special map from VIA that was put together specifically for the night and made up a demo specifically for the VIA night. We ran Quake III in two settings, one at low res, with max geometry and low graphics detail to push the CPU, and the second setting was at 1,024 x 768 with everything maxed out, specifically to push the graphics card. The final benchmark was 3DMark2000 Pro for the graphics end of things, and this was run at both 1,024 x 768 and 1,600 x 1,200 at 16-bit and 32-bit colour. The reason that we did not run 3DMark2001 was that we expected to see a GeForce3 or two, and by the nature of 3DMark2001's optimisations, it is not an apples-to-apples comparison to run it up against a GeForce2. For the C3 systems, we ran the applications-based Winstone and we also threw in the same Sandra tests as the DDR systems and 3DMark2000 at the default resolution of 1,024 x 768 at 16-bit colour to show how they fare in 3D.

It was a very hectic afternoon and night's worth of testing, and to give you an idea of how we were thinking at the time, here is one of the formulas in Excel that we used to weight and normalise the benchmark scores for the DDR systems:

```
=((((B7/$B$6)*$B$5)+((C7/$C$6)*$C$5)+((D7/$D$6)*$D$5)+((E7/$E$6)*$E$5)+((F7/$F$6)*$F$5))*40%)+((((G7/$G$6)*$G$5)+((H7/$H$6)*$H$5)+((I7/$I$6)*$I$5)+((J7/$J$6)*$J$5))*30%)+((((K7/$K$6)*$K$5)+((L7/$L$6)*$L$5))*30%)
```

Testing went relatively smoothly, although there were a few hiccups with an unstable MSI motherboard used on the DDR systems from Pioneer and Peripherals Plus machines. When benchmark scores were compiled, the results were clear. Congratulations need to go out to Peripherals Plus for its stunningly-fast DDR PC, incidentally the only one featuring a production GeForce3 card, from Hercules of course, which was the decisive push over the edge. Congrats also to Clevertech, for its simple but very well balanced and top performing C3-based PC. Thanks also go out to John and Fiona Gatt of VIA Australia for organising the night, and giving atomic the opportunity to participate.

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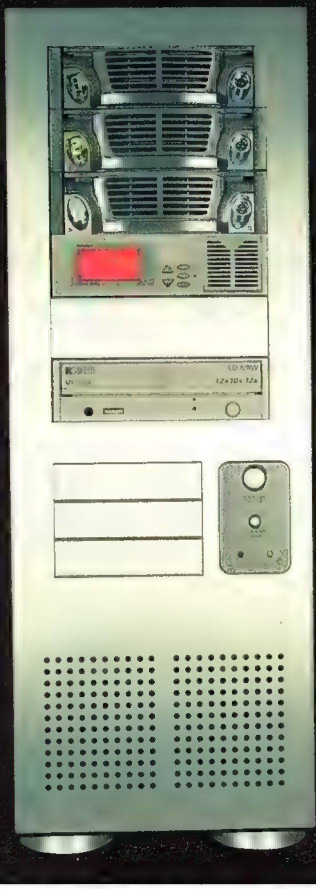

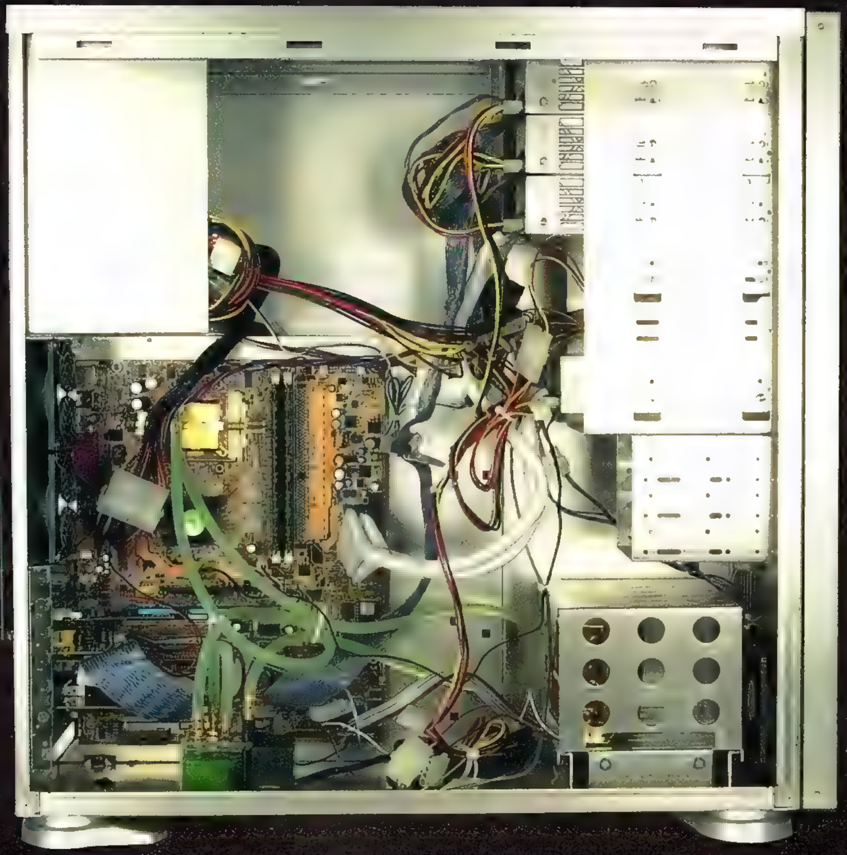

THE STORY:

The Mission: Build the fastest, most impressive box we could using only off-the-shelf parts!

The guys from VIA sent the word around that they wanted to showcase some impressive DDR-RAM based boxes for their CIII launch, with a benching showdown to find the fastest box. With no cost limits, the boys at AusPC threw the bits together in a frenzy the night before and came up with this beast we named "Gigantor". The huge cool bare-metal aluminium Lian-li case ended up being given the full works: Lots of SCSI and IDE drives, GeForce2 Ultra, FireWire, the quickest AMD 1.33GHz CPU, PC2100 DDR RAM, a nice burn-proof CDR, and matching silver mouse, keyboard and LCD monitor. But, since there were bound to be others out there with similar speed parts, we added those extra features that only the loony hardware geeks would love - a sealed water-cooling kit , a DigiDoc5 to control the power for the gang of quiet 80mm fans (1 in PSU, 1 on radiator, 4 in case) and a Just Cooler remote on/off controller!

On the night of the launch, the beast stood out from the crowd of beige boxes on display, and was only outshone by the VIA Marketing Manager's own Lian-Li with side window and sound-activated blue neon! In the benching results, she was as stable as a rock; the sealed water-cooling kit kept the CPU to 40 Degrees under load, and around 29 Degrees when idle (quiet too, without the howl of a 7000RPM CPU fan) This was not bad at all, considering some of the others nearby were swapping out motherboards and reinstalling Windows during the contest benching.

A lot of people regard water cooling as an extreme practice, however the Golden Cool system we used is an off-the-shelf package that needed less than 1 hour of installation time, and no workshop tools other than a pair of scissors for cutting the tubing and some double-sided tape to attach the parts to the case. The original attachment method is a little more elegant - some very powerful rare-earth magnets, but they don't tend to stick to the Aluminium Lian-Li cases too well! No buckets of water standing around, no noisy buzzing pumps, and it's all hidden away inside the box. Whilst the 1.33GHz AXIA Tbird is doesn't overclock as much as the lower speed Athlons, people have reported getting 1.4 - 1.5Ghz from recent 1Ghz AXIA Tbirds even without the water cooling setup.

The final results were great - Gigantor came second only to a system sporting the uber powerful Hercules GeForce3 with leaked drivers.

Proud of your Hot Box? Send a pic of the front and side to hotbox@atomicmpc.com.au. We'll be in touch if we like what we see.

SPECIFICATIONS:

Hercules 3D Prophet II Ultra
PC-2100 256MB 184-pin DDR SDRAM (Apacer - Samsung)
Lian-Li PC-70 Full Tower all-Aluminium case
Golden Cool sealed water cooling kit
Enermax 430w ATX PSU
AMD Athlon 1.33Ghz (133/266 DDR AXIA Tbird)
Asus A7M266 motherboard
Samsung 15" 570STFT LCD Monitor
Ricoh 32x12x10 CD-RW IDE drive
Skymaster Firewire IEEE1394 PCI Card
IBM Deskstar 60GXP 40Gb 7200 ATA-100 IDE HDD
2 x SCSI HDD
Tekram DC315U PCI SCSI card
Digital Doc 5 temp/voltage monitor and fan controller
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3 x Lian-Li SCSI Hard Drive Mobile Racks
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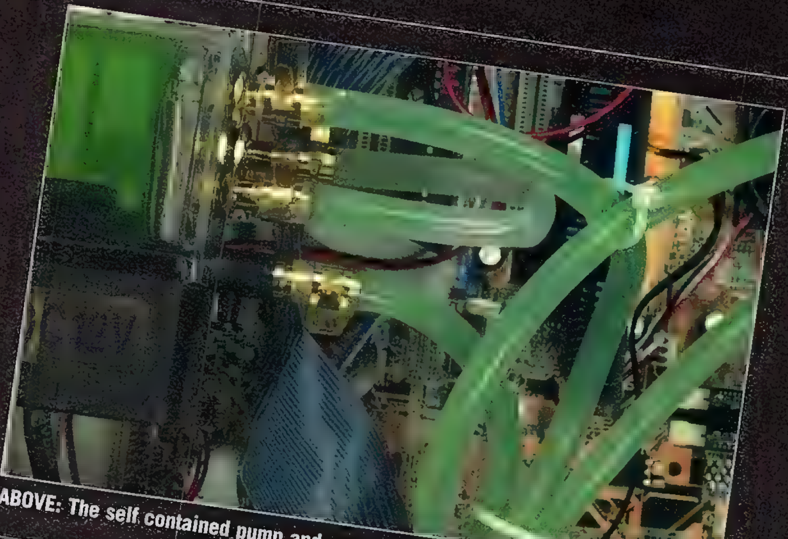
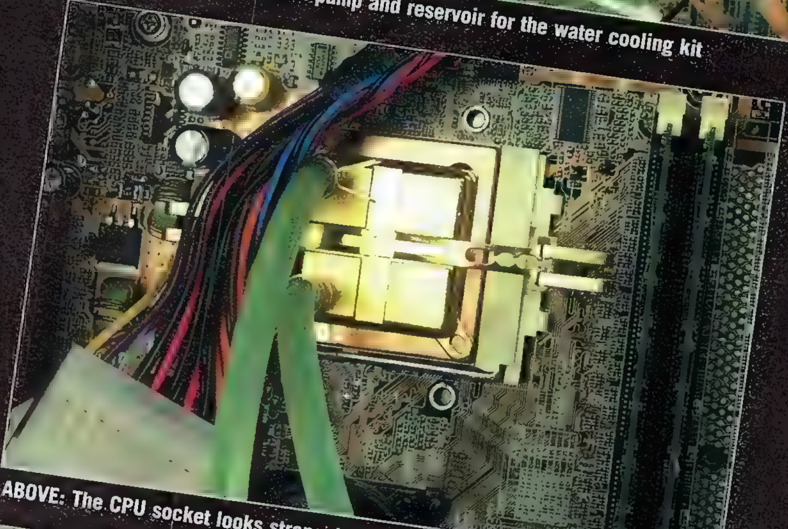
Just Cooler Remote Control
Silver Laptop Keyboard
Silver Mouse

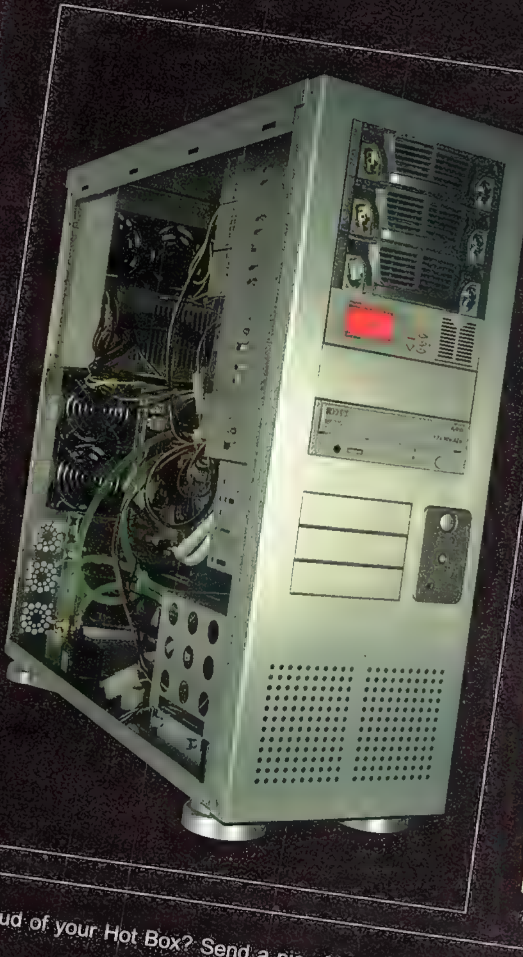
Total = $7500

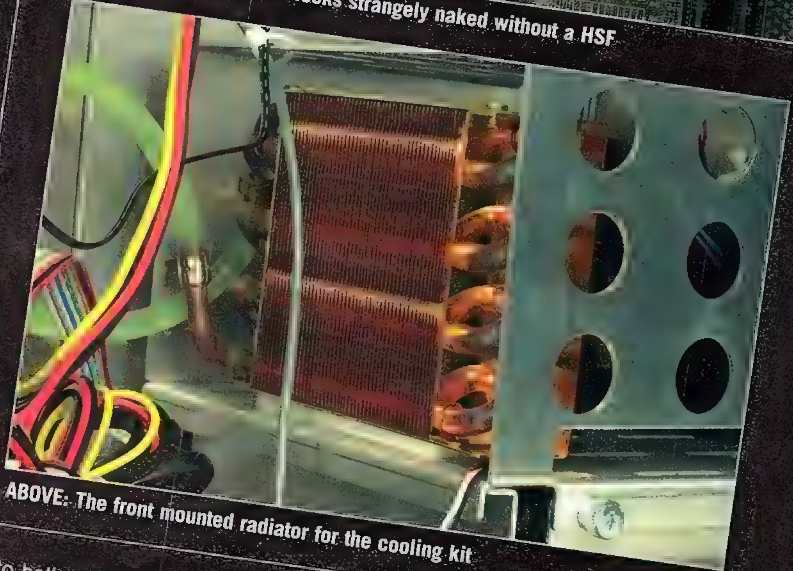


ABOVE: The self contained pump and reservoir for the water cooling kit



ABOVE: The CPU socket looks strangely naked without a HSF



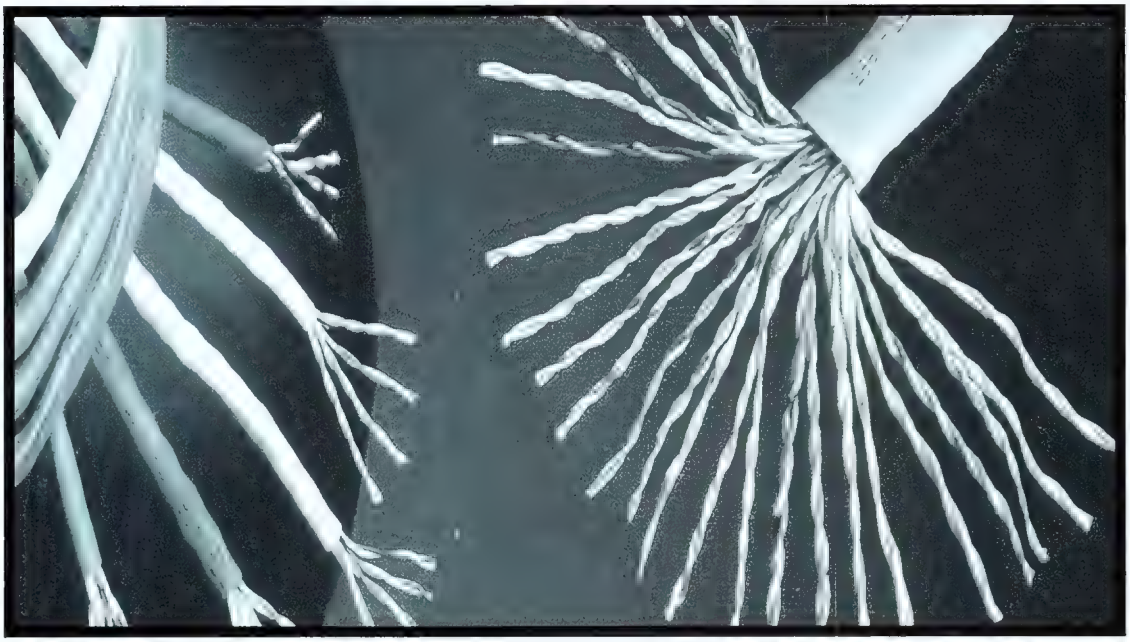


ABOVE: The front mounted radiator for the cooling kit

Proud of your Hot Box? Send a pic of the front and side to hotbox@atomicmpc.com.au We'll be in touch if we like what we see.

Broadband H2H – A week in the life of an LPB

Bennett Ring, Dave Apelt, Tim Dean and Ashok Zaman put the big three home broadband options through the pinger



Cable Internet access arrived on our shores a couple of years back, but due to the high cost of laying cable and differing regulations for each council, only a small proportion of our country was ever covered. Since then, a battle of words has been waged online about which of the two major cable providers, Telstra or Optus, provides the best service. For people wishing to sign up to either of these services, the only information available has been anecdotal evidence that is impossible to find outside of an IRC channel or online forum.

The remainder of the nation not covered by the cable networks have been hungry for a technology that will give them broadband access, ever since playing against their first cable powered LPB (Low Ping Bastard). The technology that promises to do this is DSL, which stands for Digital Subscriber Line. The type of DSL most in use in Australia is Asymmetric DSL, otherwise known as ADSL. The coverage of this product is still somewhat patchy, but Telstra is promising to have most of our metropolitan areas covered within the next couple of years.

Since the launch of Australia's ADSL network, another heated discussion has begun about whether ADSL is as good as, if not better than, the performance enjoyed by cable users. It was time to end the Optus vs Telstra and ADSL vs Cable debates with one fell swoop, so we benchmarked both the BigPond Cable and ADSL service, as well as the Optus@Home Cable service.

HOW WE TESTED

We always knew that testing each connection accurately and fairly wouldn't be an easy feat, but we soon realised that there were two main things you would be interested in as home users and/or gamers: ping times to gaming servers and average connection download/upload speeds.

Testing ping times was the simplest part of the procedure. With much assistance from Dave Apelt of www.tcpiq.com, we wrote up a small batch file. When run, this file pings three different Australian gaming servers; an Optus games server, a BigPond Wireplay games server and an IPGN games server. We chose these three as they are the biggest banks of game servers within Australia, and all reside on fairly hefty connections. The batch file also pinged the US EverQuest server drinal.everquest.com, so all you EverCrack heads could find out the optimal service for your online RPG needs.

Using Windows System Scheduler, the test was set up to run at 7am in the morning and 7pm in the evening, after viewing the useage stats of the ISPs. The morning test was used to see the performance of each network when it was under the least load, while the night time tests were conducted around the time that each network would be experiencing the highest amount of traffic.

At the same time as pinging these four servers, we also ran a traceroute to each server. This was to help identify any problems, and to see how the routing changed during peak and off-peak times.

Now we had the gaming latency tests sorted out, it was time to figure out how to test download speeds. It was here that Dave Apelt's assistance proved to be invaluable, as he has already developed an online tool for this very purpose.

When running the test, the first thing that the Line speed meter at www.tcpiq.com does is to find out the round trip time, more commonly known as ping. This is the average time it takes between requesting a function call to the line test Web page, and the time it takes to actually receive it at the user's end. This is done ten times to calculate the average round trip time, and the final value is known as R in the line test algorithm. The line speed meter then downloads a 50K file to get a rough guide about how fast the user's Internet connection is. A high speed connection will then download and time a 200K file while a slower connection will request a smaller file. The time it takes to download the file is known as 'T1'. The total file size of the downloaded file, in bytes, is known as D1. Combine these into the following algorithm:

Line speed = (T1 – R) / (D1 x 8) Kbps

and you have a simple formulae for accurately measuring download speeds.

This test is run using several different file sizes, as the larger the file size, the more accurate the test results will be, and variations of the above calculation are used with these results. By removing the round trip time from the time it takes to download the file, it tests only the maximum throughput of the line, making the test more accurate for our purposes.

Dave modified the line test Web page so that we could open the page using the Windows System Scheduler and have the tests run automatically. Each connection was given a specific ID number, and the results were automatically stored in a central database. We scheduled this test to run five times in the early morning, and five times during peak hours. We decided to run it five times each time to average out any inconsistent results. The tests were staggered for each connection so that at no time would two of the connections both be accessing the test page at once. The server that the tests were run from has a duel 100MB connection, which is more than enough to handle our tests even while under substantial load, and was located at Web Central, which is based within Australia. Thus our download test only tests the maximum practical download speed from a site within Australia.

Even though we tried to be as thorough as possible, there are still variations that must be taken into consideration when testing Internet connections. Factors such as location, distance from the exchange, overloaded network nodes and the time of day all play a part in a connection's maximum speed. But overall, our tests should give you a good idea of what performance levels each connection is capable of. Both the ping/tracert tests and the download speed tests were run over a period of seven days, again to average out any fluctuations that may have occurred from day to day. Then it was simply a matter of leaving our PCs online for a week, and sitting back as the results flowed in.

Each connection was used for over a month and benchmarked for a week. Following are our experiences with each service, as well as the results of our benchmarks for each of the connections.

Remember, each connection can be seen as a single random sample of each network, so performance may vary across other connections.

Bigpond ADSL connection

Web site: www.bigpond.com

Easily the most widely available ADSL network, Telstra's BigPond ADSL is currently in very high demand. At around $70 per month and above for unlimited download accounts, the service initially seems rather expensive compared to a dial-up account. But, when you take into consideration that you won't tie up the phone when you are online, therefore negating the need for another home phone line, and that you will no longer need to dial up each time you log on, the cost is actually competitive when compared to dialup, especially for the regular net user. Add to that the benefit of a constantly connected service (no waiting time to dial-up, simply boot up and you're online) and ADSL looks to be a rather nice broadband option.

We tested the 512Kbps download / 128Kbps upload Freedom Deluxe plan. At $89 per month, or approximately $20 more if you don't use Telstra as the primary telephone supplier for all home phone calls, we locked into an 18-month contract. After a cancelled installation appointment one month after being approved, a further two months waiting after that for the installation, and a minor technical problem with the PC setup, the service was up and running. For the first few weeks, we were in low ping paradise. The difference between the old 56k modem and the ADSL modem was amazing, with zero packet loss within all games and pings of 60ms to local servers. Downloads frequently zipped down the phone line at 55KB/sec, close to the theoretical maximum speed of approximately 60KB/sec, allowing mp3's to be played as they were downloading and speeding the Web up so that pages downloaded to the browser almost instantaneously.

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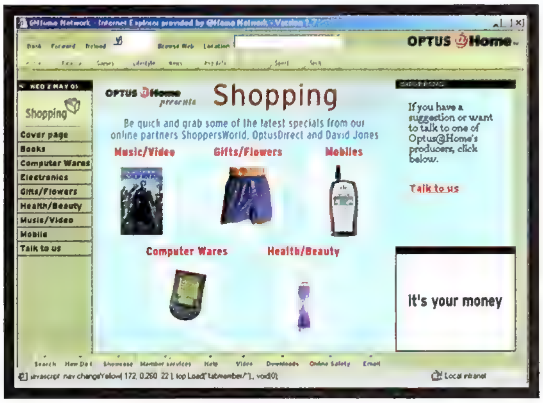

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However, over the coarse of several weeks, the pings steadily began to climb while download speeds began dropping. Before we knew it, the best pings attainable to the servers in our test were around the 250ms mark, around 100ms higher than the old 56k modem! Downloads rarely exceeded speeds of 30KB/sec during peak hours, but as when we tested during the early hours of the morning, pings were back to sub-100ms, and downloads flew down the line at warp speed nine. It was obviously a case of network congestion that was the root of the problems we were experiencing.

Further investigation (traceroutes are fun!) led us to discover that regardless of where in Australia the user is located, all BigPond ADSL traffic is first routed via Victoria. Due to problems (most likely overloading) of the Sydney/Victoria link, this single hop increased from around 30ms during off peak times to around 150ms during peak hours, and is currently sitting at that speed.

Victorians still enjoy low pings, but this single router for the entire network is obviously a problem. Perth people have it worst, for if they wish to play on a WA server, their signal actually travels from Perth to Victoria and then back to Perth again before reaching the server.

We recently spoke to a Telstra spokesperson about these problems, and they promised that they would have the Sydney problems resolved within a week of the time of writing. We'll let you know if they keep this promise, if not, they're not getting our first born. As for the other states, who's traffic is still being routed via Victoria, Telstra said that state based routers would be in place within the next 3 to 6 months, which should rectify ping problems as well as increasing download speeds.

It is obvious that the ADSL network is still in its roll-out phase, with several problems that need addressing. If these problems aren't ironed out, and you can be sure we'll keep you posted, ADSL is not acceptable for the gamer or home user, offering as little as four times the download speeds of a 56k modem at triple the cost. But as the results of our tests show, especially those conducted during off-peak hours, ADSL has the potential to offer very similar levels of performance as the BigPond cable service. Combine this with its higher coverage and ADSL could become a very attractive option indeed, finally bringing broadband to the masses.

Optus@Home

Web site: www.optushome.com.au

Optus@Home runs off the Optus broadband cable network, which feeds the Optus cable television and telephone, and currently passes around 2.2 million homes, although it is only available in parts of Sydney, Melbourne and Brisbane. The bad news is that Optus is not laying any further cable in Australia, so if you are not covered now, then you will never be.

Optus@Home utilises an industry-standard DOCSIS (Data Over Cable Service Interface Specifications) modem, which has the benefit of using standardised components, and allowing future upgrades with off the shelf hardware instead of being restricted to using proprietary hardware.

Installation of the cable service is fairly straight forward. Optus@Home doesn't require that you log in using any special software, such as with the Telstra service, and instead it serves much like a WAN. There is software that comes with the installation, including Optus@Home-customised versions of IE and Netscape Navigator, although you are not required to use these if you don't want to.

In performance terms, the Optus@Home service is capped below the maximum capacity of the cable and modem, making it slower than Telstra's uncapped 10Mbit service, although the Optus@Home cap is much higher than Telstra's 512Kbit service. In downloads, it is not unusual to see speeds approaching 600KB/sec (4,800Kbit/sec, or roughly 85 times faster than a 56K modem), although the average is around half this from Australian servers, and usually maxes out around 50-60KB/sec from overseas servers. This opens up just about everything that the Internet has to offer in terms of high-bandwidth content like streaming audio and video as well as big downloads. It is not uncommon to be able to download an entire album's worth of MP3s in less time than it would take to listen to them.

When it comes to gaming, the Optus@Home service also delivers in spades. Not only do you get sub-100 pings to just about any server in Australia, you can also get decent pings to the US care of the Southern Cross cable. Optus@Home also runs a great number of its own servers, running everything from Counterstrike, Quake III Arena, Tribes, Unreal Tournament and Kingpin. At the time of writing, we counted no less than 48 games servers running on the Optus network. The pings to the Optus@Home servers range from excellent to ridiculously excellent, with the lowest ping we saw experienced in Counterstrike being around the 10ms mark.

The Optus@Home service also comes with content provided through a local portal, meaning speeds are always very fast. The local content includes everything from local and international news feeds, to special sporting presentations, online shopping, arts, finance news, game demos, movie trailers and horoscopes from partners such as CNN, NineMSN and Bloomberg. You also have the option to run up to five email addresses and 10MB of Web space for each email address as a part of the standard service.

Finally, in terms of cost, there are two basic plans you can choose from depending on whether you

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OPTUS@Home™

want to sign up to a contract or not. The Lightning Fast plan, with 12 month contract, has a subsidised installation fee of $199 and a monthly charge of $74.95, and the non-contract Warp Speed plan costs $598 to install but is then only $69.95 a month. On both plans there are no strict download limits, although you do have to agree to an Acceptable Usage Policy, which limits users to utilising no more than ten times the average amount of bandwidth calculated for all Optus@Home users over a 14 day period, which ends up being quite a lot, and very few users ever actually reach this level. Even if downloading ISOs or Linux distributions every day is your thing, even a little moderation will keep you under the limit.

Given the startling bandwidth and pings of the Optus@Home service, the range of services such as email, web space, games servers and special content and its reasonable cost compared to ADSL and dialup (including call charges), the inevitable conclusion is that if you are looking for a broadband connection, and you have Optus@Home available, there really is no other choice.

BigPond Cable connection

Web site: www.bigpond.com

As the first broadband provider to hit the Australian market, Telstra BigPond cable had the luxury to do what they wished with the service without fear of competition. Unfortunately this meant a service that prohibited many potential customers from switching to broadband, severely limited with restrictions and limits. Firstly, despite offering the full 10Mbits of bandwidth, this was crippled with a 500MB download cap, with extra charges added for every Megabyte after that. While 500MB may sound like a lot to some, with a broadband connection functioning at peak performance one could conceivably download their monthly Megabyte allowance in less than 10 minutes. Add to that the port restrictions that only allowed subscribers to surf the Web or use FTP, while restricting things like IRC, teleconferencing, and most importantly, games.

Fortunately for the public, Optus@Home raised the bar when it came to offering a broadband service that was actually a viable option for many users. This quickly prompted Telstra to change their tack toward offering a service that is actually worthwhile. For the purpose of this roundup, the home user oriented service was tested, the Freedom Deluxe plan with 512Kbit download and 128Kbit upload speeds. Like the other services BigPond Cable is only available in certain areas of Sydney, Brisbane and Melbourne, and likewise, there are no future plans to roll out more cable, as Telstra is now focusing on their ADSL network. Installation is taken care of by a Telstra technician and will cost you $189 if you choose to go with the 18-month contract. For those who have installed a network card and connected it to a LAN in the past, the process really is not much different, though initially the technician will punch in your subscriber ID number to activate the account. The login software if followed through on default settings will customise Internet Explorer, and set the Telstra BigPond Web site as your home page. If you don't want it as your home page, be sure to skip the Internet Explorer component of the installation setup, otherwise the home page will revert back to the Telstra portal every time you boot up, no matter how often you change it, or even if you upgrade Internet Explorer with the latest update. The only way to get rid of it is a good re-format and reinstall of your OS.

In terms of speed and reliability, the roundup testing reveals the BigPond cable service operates close to peak performance, though over the months there have been a few service outages, and issues with service congestion, all of which have occurred without any offer of re-numeration, though most of the bugs seem to have been ironed out of Telstra's cable network. Unfortunately for BigPond subscribers, they do not get the same download speeds as those on the Optus@Home service which can be as high as 4Mbit/sec or faster, due to the fact that BigPond Cable is rate limited to 512Kbits/sec, which equates to 64KB/sec.

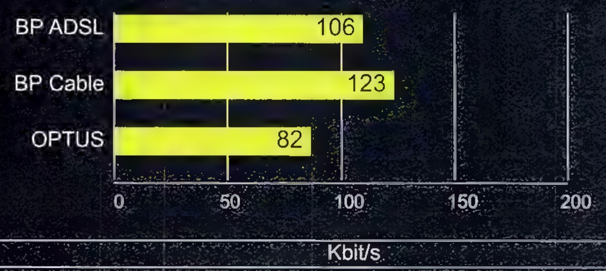
Though this is very quick - around ten times faster than a 56K modem – it simply does not match the monumental speed that is offered by Optus, even when downloading from a local FTP and obtaining peak rates. One hub is designated to handle the traffic at the street level, and throttling back the cable prevents this hub from overloading beyond it's capacity, or so the argument goes according to Telstra. While this may be true, it still does not disguise the fact that Optus are capable of providing over four times the network speed without any such overloading problems.

As a portal the Bigpond home page offers all the typical services like news and sport, plus entertainment and shopping, with a few Wireplay game servers left over from the proprietary dial-up game network, running things like Counter-strike and Quake III Arena.

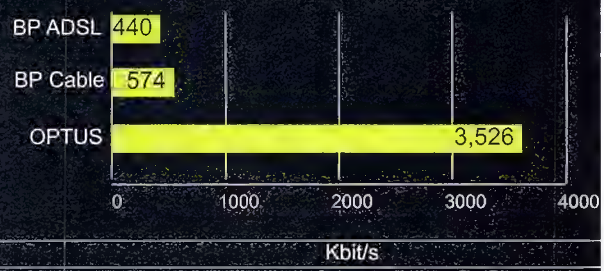
It is not quite like the depth of the Optus and Excite@Home combination, which has secured some heavy weight content for local users. Bigpond offers a range of plans with a host of different services, including full speed business plans and a cheaper Freedom plan, with a 64Kbit upload speed. When all is said and done, it is still difficult to complain about the speed you get with Telstra cable, and is a great option if Optus cable is not available in your area.

DOWNLOAD/UPLOAD SPEED TESTS - HIGHER EQUALS BETTER

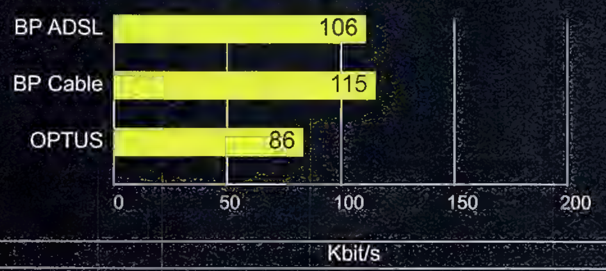
Average Morning Upload



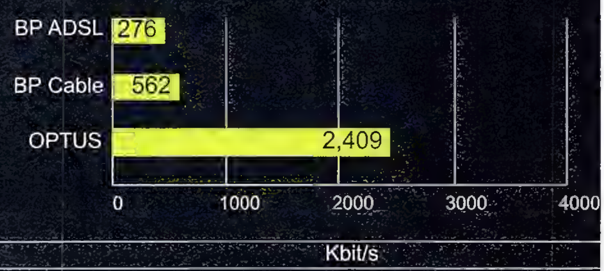
Average Morning Download



Average Evening Upload

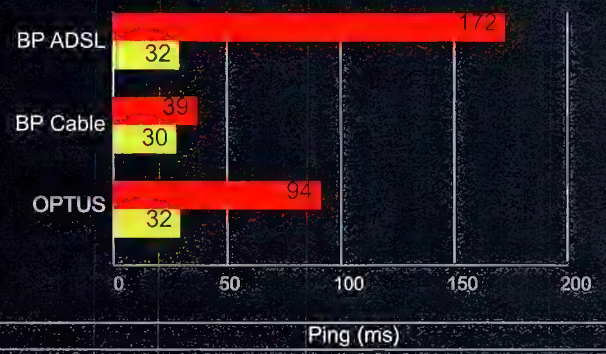


Average Evening Download

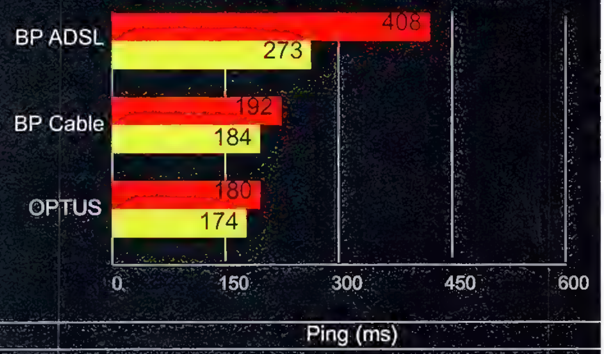


GAME SERVER PING TESTS - LOWER EQUALS BETTER

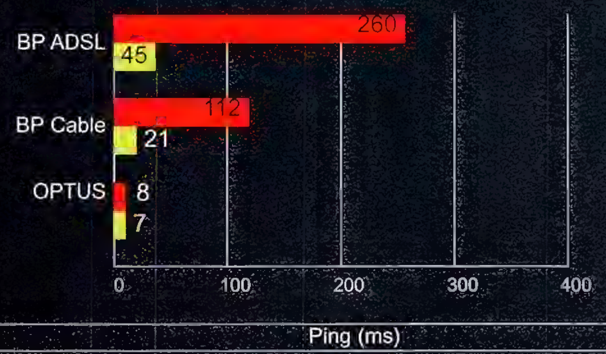
IPGN Average Pings



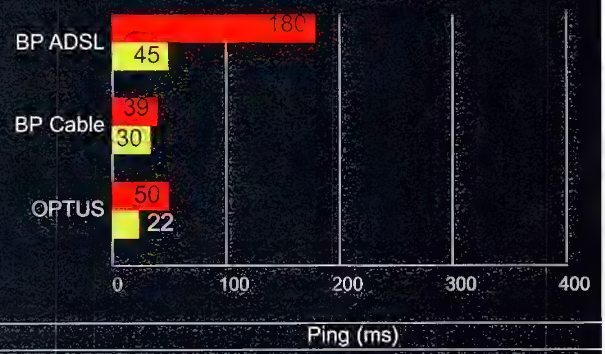
EVERQUEST US Average Pings



OPTUS Average Pings



WIREPLAY Average Pings



KEY TO ATOMIC GRAPHS 🟥 Evening 🟨 Morning

How It Works: RAID

Daniel Rutter tears open his case, stares at four stacked hard drives and declares it a RAID

RAID is an acronym that stands for Redundant Array of Inexpensive (or recently, Independent) Disks. It was first proposed in 1987 by a trio of Berkeley researchers who recognised that while solid state PC hardware, like the CPU and RAM, were increasing in speed exponentially, I/O and hard disk technology was progressing much slower, and was falling behind. Big mainframes were only able to keep their I/O fast by utilising massively expensive high-speed drives, and even the desktop hard disks were not that much slower. The researches proposed a solution in terms of linking multiple desktop-class hard disks together and running them in parallel so that they appear as just one drive. In recent times, RAID has become a popular solution for desktop users who desire greater hard disk performance, but don't want to use extremely expensive options like 10,000 or 15,000rpm SCSI disks.

RAID is primarily a performance option, but it can also be used for data protection. With some types of RAID you can install a 'parity' disk that provides data redundancy. This means that if one the disks in the RAID array fails, the parity drive automatically kicks in and everything runs as normal without you losing data, or even having to shut your system down while you restore files from a backup.

> **"RAID is primarily a performance option, but it can also be used for data protection."**

RAID systems used to all be SCSI (Small Computer Systems Interface), although recently there has been a proliferation of IDE RAID devices. There have also been an increasing number of PC motherboards released over the last year or so that come with IDE RAID controllers on board. These generally have four IDE cable sockets, and you can plug two drives into each one. Abit, Asus, Epox, Gigabyte and Iwill, for instance, all have IDE RAID-capable motherboards, for both Intel and AMD CPUs. They use inexpensive Highpoint or Promise chipsets, and they don't cost much more than similarly specified motherboards with four IDE connectors.

The IDE connectors on these motherboards, and on the stand-alone cards, can also be used for up to four perfectly ordinary separate drives, if you like. You also don't necessarily need hardware support to be able to use RAID, either. Windows NT Advanced Server and Windows 2000 Server both support software RAID, as do the leading PC flavours of Unix and Linux, where some RAID modes are built into the kernel, and FreeBSD, using software like the Vinum Volume Manager, www.vinumvm.org. Software RAID isn't as fast as hardware, but the principle is the basically the same.

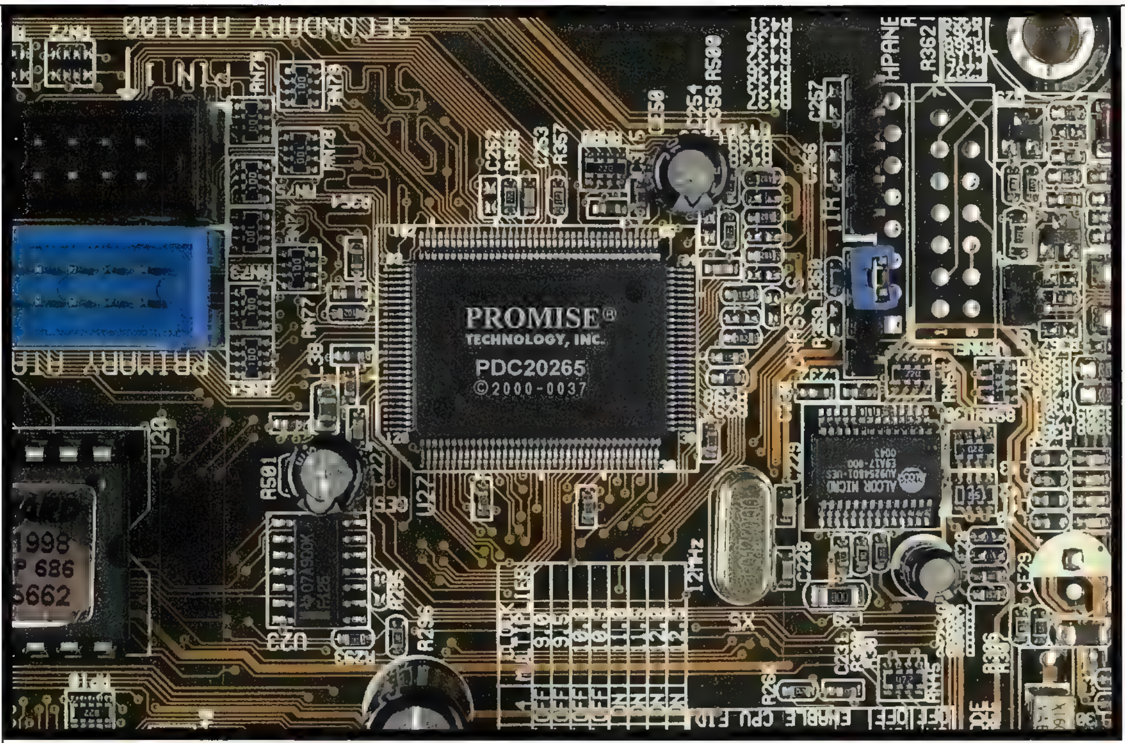
RAID 0

There are several different possible implementations of RAID, the simplest known as 'spanning', which simply adds drives together end to end. With spanning, you can use drives of different capacities and use all of the space on all of them. The other no-redundancy type of RAID is called 'striping', and its most basic implementation is RAID 0. In RAID 0 you can link multiple drives together, and data is written to, and read from, the drives in turn. Drive one deals with the first 'block' or 'stripe' of data, then drive two gets the next block, and any subsequent drives in the array get their turn before the data transfer operation goes back to the first one. Both RAID 0 and spanning give you a performance improvement because multiple drives are simultaneously serving the computer's requests, thus sharing the overall load between them. RAID 0 is faster than spanning because you can have multiple drives that are all sending data at once instead of all the data being read from only one disk at a time. Spanning only gives you a performance improvement if you happen to be reading and writing to different drives at once. RAID 0, by its nature, means you're always doing that. Since there exists an overhead in terms of latency in reading and writing the data on both drives, as well as the RAID controller directing the data around, the performance improvement is not significant, and can even be slower than a single drive, when transferring lots of small files. RAID 0 in particular really comes into its own when transferring large files, such as when editing a digital video.

If any drive in a RAID 0 array fails, however, you lose all of your data. In a four drive set with a stripe size of one byte, each drive holds one out of every four bytes of data, removing one is like removing every fourth link from a chain.

RAID 1 and 0+1

If you want data security, the simplest mode is RAID 1, also known as 'mirroring'. In RAID 1, every drive in your array has an additional mirror drive that holds



Many motherboards incorporate Promise RAID controllers

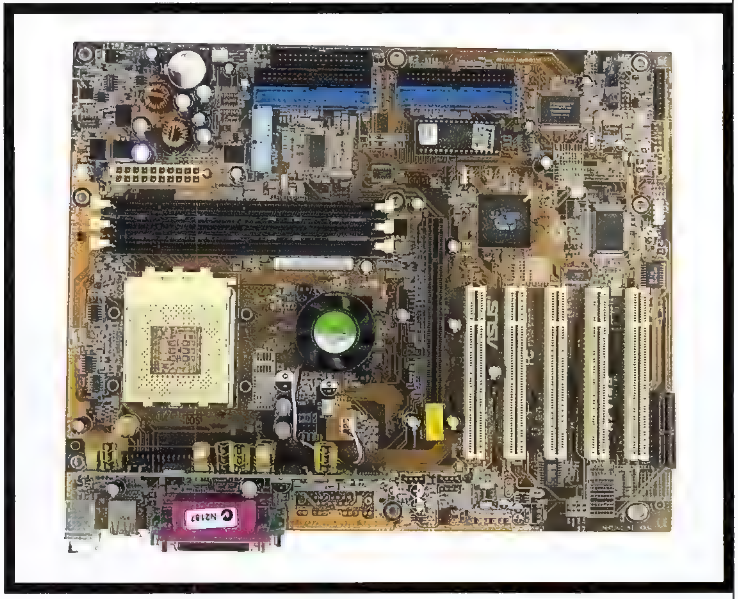
an exact copy of the data. If one of your drives fail, then there will always be another drive with an exact copy of the data on it. Only if a drive and its mirror drive both fail do you lose the data. Mirroring doesn't give you a performance improvement, and it also halves your effective disk capacity. A RAID 1 set of two 20GB drives only has a 20GB capacity. Mirroring does provide strong, albeit inefficient, redundancy, and eliminates the chance of a problem with any one drive killing all your data.

Basic IDE RAID controllers only support RAID 0 and RAID 1, but they can do them both at once when using four drives by using the hybrid RAID 0+1. RAID 0+1 is slightly slower than plain RAID 0, but the difference is not significant. It gives the benefits of both striping and mirroring but, because of the mirroring, you still have to buy twice the disk capacity. Four 20GB drives will give you a 40GB RAID 0+1 set. You can also use striped and mirrored RAID on drives of different types, and with completely different capacities. If you do, however, the RAID set that you build will only be as big as the capacity of the smallest drive.

RAID 3

RAID 3 is similar to RAID 0, but it also includes error-checking and redundancy through the addition of a 'parity disk' for each pair of 'data disks'. Data is striped across the data disks just as in RAID 0, but the third disk holds parity information, which is used for error correction. Thus given any two of the three disks, you can figure out what is on the third. RAID 3 data striping is done at the bit or byte level, so if you write even two bits of data to a RAID 3 array, then you write to both data drives, and to the parity drive. This makes data accesses to RAID 3 arrays slower than those to a RAID 0 array. For reads, however, RAID 3 is still very speedy. In a three-drive set, you read from the two data drives just like a normal stripe-set, and the parity drive doesn't have to do anything at all.

This clever system gives very nearly as much redundancy as mirroring, since you can still lose any one disk of each three-drive part of the RAID set and not lose any of your data. But it lets you use two-thirds of the disk space you buy for actual storage instead of only a half, compared with RAID 1. Therefore, if you install three 20GB drives it will give you a 40GB RAID 3 array in total.



The Asus A7V comes with optional RAID support

RAID 4 and 5

RAID 4 is exactly the same as RAID 3, except that instead of working with the data on the bit or byte level, it works in blocks like RAID 0, which increases performance slightly. RAID 5 uses the same idea as RAID 3 and 4, but instead of having a separate parity disk, it stripes the parity data along with the 'real' data across all of the drives in the array evenly. In RAID 5 you still use the equivalent of one disk in every three for parity data, and still get two-thirds of the combined capacity of the drives. Like RAID 4, RAID 5 stripes data at the sector level, or in blocks. Since PC disk sectors are generally 512 bytes (4,096 bits), only writes bigger than 512 bytes require the involvement of more than two drives out of a three-drive set. Since data transfers have to happen in sector-sized chunks anyway, RAID 5 ends up being faster than RAID 3 for writes. For reads, RAID 5 is slower than RAID 3. This is because all of the drives have to do work whenever any significant amount of data has to be read, and that data is spread out over all of the disks with parity data interleaved into it.

Professional-level SCSI RAID controllers also have 'hot swap' capability – they let you swap drives while the computer is still running, and can rebuild the set on the fly while still serving data. Cheap IDE RAID controllers require you to shut the system down to swap drives, but you can also get IDE RAID controllers with hot swap, and even with 'hot spare', which means they keep one or more spare drives connected all the time, and can rebuild the RAID set onto them if one of the other drives fail.

Making it happen

If RAID 0, 1 or 0+1 are good enough for you, and you don't need more than four drives in any one RAID array, then the current collection of cheap IDE RAID controllers on a PCI card or integrated into your motherboard are probably just what you're looking for. In the BIOS for most RAID controllers, making RAID arrays can be done from a simple menu interface. Once you've done that, the OS just sees the RAID array as just another perfectly normal single drive.

If you want fancier hardware RAID features, you don't necessarily have to buy a much more expensive SCSI solution. The better IDE RAID controllers cost the same kind of money as basic SCSI RAID controllers with similar features, but they still use the much cheaper IDE drives.

Promise's SuperTrak-100, for instance, is an IDE RAID controller that supports up to six drives, with hot swap and hot spare, and retails for around $1,000. 3Ware's Escalade 3W-6400 is considerably cheaper, at around $750 or so, but unfortunately it only supports up to four drives, and RAID 0+1 is the best it can manage, although it does have hot swap and spare capabilities.

Overall

For power users, RAID-enabled motherboards with four IDE connectors are funky things to have, especially if you need that extra sustained I/O performance or data redundancy. For the majority of home users, however, four-IDE-connector motherboards are overkill since they don't need that many drives, and they won't reap the benefits of the RAID features. You might as well just set up ordinary separate drives, especially if nothing you're putting on them needs one vast drive. If you do need basic RAID and want the bragging rights that come with it, you can now get it for a fairly low overall cost, and you really can't complain about that.

RAID	min disk#	Function	Benefits	Problems
0	2	Data blocks broken down and 'striped' across disks	Faster read times, easy to set up	Failure of a single disk means the loss of all data
1	2	Data is mirrored between two disks, providing a backup of all data	Failure of a single disk means no data loss, simple design	Incredibly inefficient disk usage
0+1	4	Data is both striped across disks then mirrored	Good redundancy, high speed	Expensive, failure of one disk means that it will effectively become a RAID 0 array
3	3	Data is striped and error checked on read and write by a parity drive	Parity drive means that two thirds of the total disk space is available, no data loss will occur when one disk fails	As slow as a single drive, complex design
4	3	Data blocks are striped and error checked using a parity drive	High read speeds, low number of parity drives required	Slow write speeds, difficult to rebuild after a drive failure, complex design
5	3	Data blocks are striped and interspersed with parity blocks across all drives	High transfer rates, low number of parity drives required	Difficult to rebuild after drive failure, complex design

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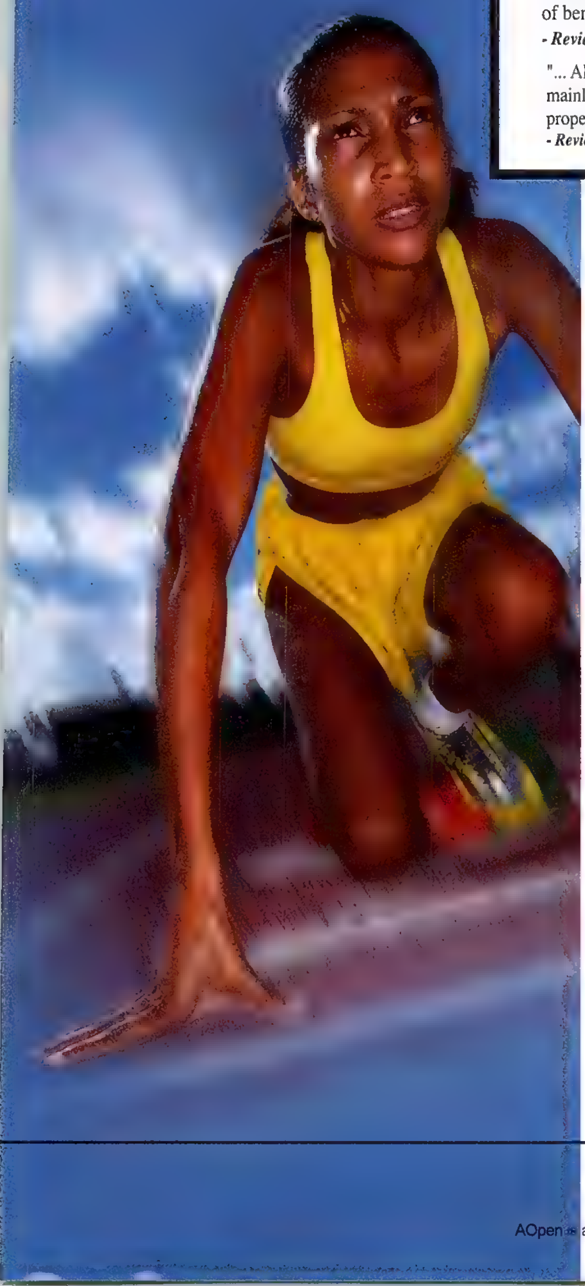

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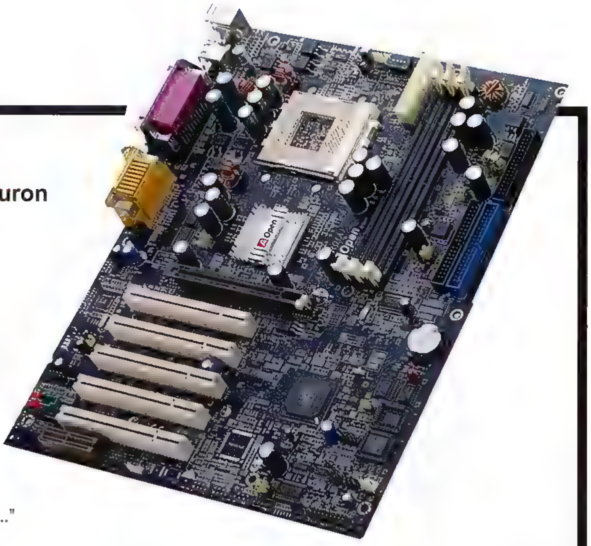
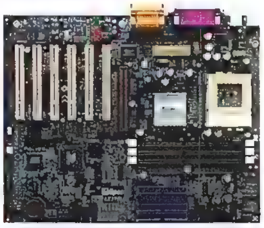


AK73 Pro(A)

- * VIA KT133A for AMD Athlon/Duron
- * 266MHz FSB
- * 4 X AGP
- * ATA-66/100 IDE
- * Audio onboard

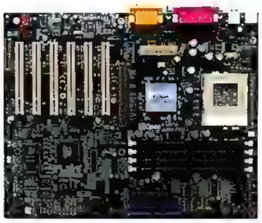
"...AOpen AK73 Pro was pretty impressive. **It beat our previous performance leader, the ASUS A7V**, in the majority of benchmarks."
- Review from Tom's Hardware Guide.

"... AK73 Pro was rock solid, mainly the result of a solid layout, proper placement of surface mount components..."
- Review from AnandTech



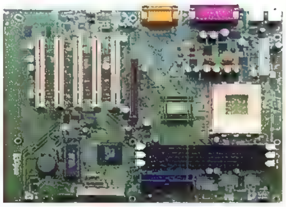
AX37 Plus

- VIA Pro266 for Celeron/PIII
- support DDR SDRAM
- IDE RAID onboard
- 4X AGP / 4(+2)USB
- 1Mhz Stepping FSB
- Audio onboard



AX34 Pro-II(ATA100)

- VIA 694X for Celeron/PIII
- 4 X AGP / 4 USB
- ATA 33/66/100 IDE
- Audio onboard
- Dr. Voice
- Die-Hard BIOS (optional)
- Dr. LED (optional)



AK33

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- Audio onboard

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GROSVENOR

REVISITING THE PENTIUM 4

John Gillooly looks at the best boards for everyone planning on surfing the latest wave of Pentium 4 price cuts

Intel's latest leap in processor architecture, the Pentium 4, was finally released late last year to more of a whimper than a bang. Serious questions were raised over the exorbitant price tag placed on the P4, a tag that climbed even higher when you added the need for a new motherboard, RDRAM and a new power supply to get the processor running.

Rather than just a small update to Intel's existing processor microarchitecture, the P4 incorporated a new design, with several new features added purely to take advantage of the somewhat parasitic relationship that has developed between Intel and RAMBUS's RDRAM. The previous appearance of RDRAM in the i820 chipset for the Pentium III was less than startling and the Pentium 4's design was partially created to take advantage of the peculiarities involved in getting the most out of RDRAM.

Upon release AMD's 1.2GHz 133MHz FSB Athlon rapidly smacked the Pentium 4 down in conventional benchmarks. The Athlons are still cheaper and give comparable performance in non-SSE2 applications. As the Pentium 4 begins to drop in price (and as non-RDRAM chipsets begin to appear) it will begin to become a much more viable option for mainstream users. But until the DDR chipsets hit we are still stuck with the evil empire that is RAMBUS. The big problem with the DDR and SDRAM chipsets is that they will support a P4 with a completely different socket design altogether.

So now is a great time to have another look at the Pentium 4 and its various quirks and foibles. Over the next few pages we explain what you need to run a Pentium 4 system, and have a good look at all the available Pentium 4 motherboards, all of which use the RDRAM based i850 chipset from Intel as there has been significantly slow progress in getting other chipset manufacturers to licence the Pentium 4.

Taking the P4 plunge

If you are planning on upgrading your existing system to a Pentium 4 then be prepared for a major overhaul. Because of the architecture and power requirements you will need to get a new processor, RAM, motherboard, Power supply, Heatsink and maybe even a new case. This is no small upgrade, and is a major factor in the slow uptake of the Pentium 4.

It's a Heatsink Jim, but not as we know it

Boxed Pentium 4 processors come complete with one of the big arsed heatsink/fans (HSFs) that the Pentium 4 requires. The fan is a ball-bearing based variable speed model. Interestingly enough, Intel has designed the HSF retention mechanism to cope with HSFs that weigh up to 450 grams, which in anyone's book is one incredibly heavy piece of metal.

For anyone that has ever fought with fiddly HSF clips on Socket A or Socket 370 motherboards then the new HSF design will be a welcome relief. The major problem is that because of the huge size of the P4 HSF is that it is much heavier than the ones we know and love.

Because of the size and weight the HSF does not clip directly onto the CPU socket, but rather attaches to a set of mounting brackets on the motherboard. These brackets also raise the Heatsink high enough to fit on top of the large heat spreader on the P4 chip. According to Intel, these brackets are supposed to be supplied with the motherboard and come in a range of subtly different types. Some motherboards come with the brackets screwed on, some come with plastic push pins for mounting, and others like the offering from Asus come with the mounting screwed on and attached to brass risers to make it easy to attach to the case.

Mounting the Heatsink is much easier than the Socket A/370 HSF's that most people are used to. Simply place the Heatsink into the bracket and secure it with two clips, one on each end. These clips are HSF independant at the moment, relying more on the type of mounting brackets than the type of HSF. Like the mounting brackets, the clips are supposed to be supplied with the motherboard.

Feel the Power

The reason for such a huge HSF is the increased amount of heat that is pumped out by the P4. In order for the processor to be capable of pumping out this much heat, it needs extra power. In order for the processor to receive this extra power it needs extra power cables. This translates to the need for a completely new power supply. Pentium 4 motherboards require a total of three separate power connectors, the standard 20 pin main power connector, a 6 pin Aux power connector (which was already found on some power supplies) and a 4 pin +12V power connector. This update to the ATX standard is known as ATX12V and the Pentium 4 MUST have one of these supplies in order to run. The move from one plug to three plugs on the motherboard necessitates a need for a bit of thought in designing the boards. Unfortunately poor placement of these power plugs seems to be the norm on the current crop of Pentium 4 motherboards.

Just in Case

All of this is designed to be used in a new

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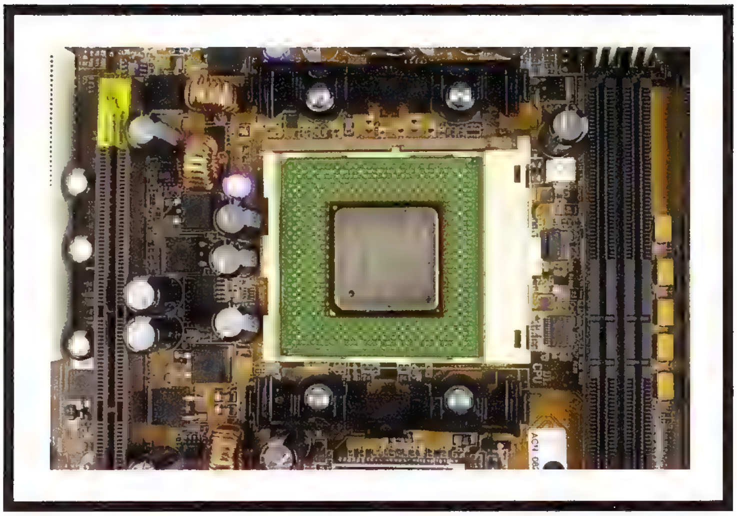
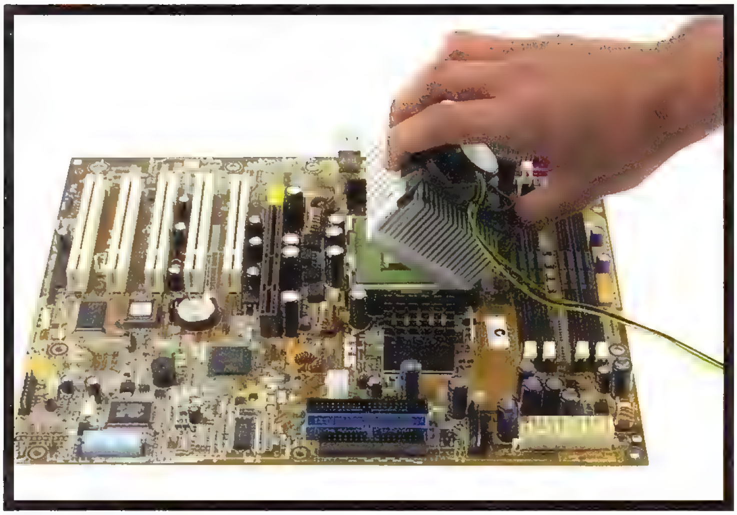
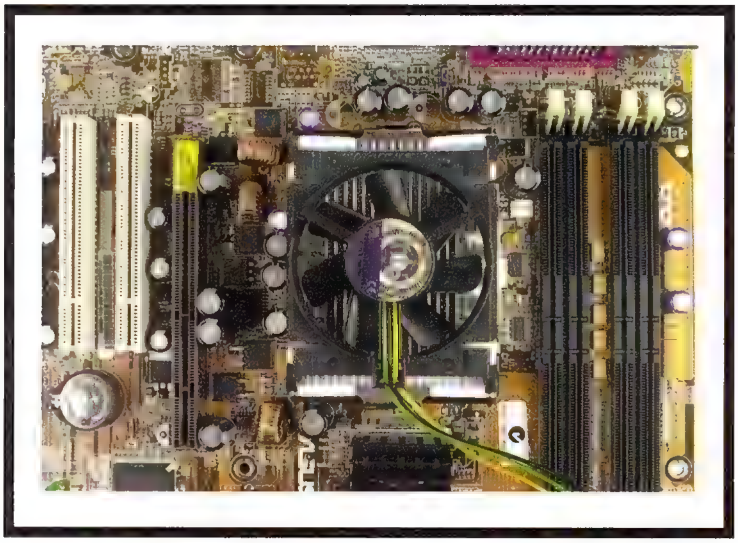


The naked processor sits in a ZIF socket between two HSF mounting brackets



The HSF simply sits on top of these brackets and is then clipped in on both sides



The mounted HSF with the brackets acting to spread the weight of the HSF

case. Intel recommends cases based upon the ATX 2.01 standard, but with a twist. To correspond with the mounting brackets for the HSF they recommend a case that has four mounting holes for the brackets to bolt onto. The big problem is that the majority of motherboards have mounting brackets that are unsuitable for this purpose.

Because P4 HSF's can theoretically weigh almost half a kilogram then this case mounting is a good idea. The potential strain put upon the motherboard by such a huge hunk of metal, especially in tower cases, is significant. By bolting the HSF to the case this strain becomes reduced. For those interested in carting their brand new Pentium 4 to LANs then bolting the HSF to the case is a wise idea indeed. If you cannot attach the HSF to the case, then try to ensure that your PC is always transported lying flat in order to minimise the strain put on the motherboard by the HSF.

Intel have also decided to focus on case cooling, given the heat pumping power of the Pentium 4. They recommend one front mounted fan and an outwardly blowing power supply fan as a minimum. Another cooling feature that Intel suggests is ducting the HSF, a feature we have seen in Dell and Gateway machines but rarely in other systems.

Beat the Heat

The need for such a big HSF and the pretty specific case and cooling recommendations are indicative of the increased thermal output of the Pentium 4. Intel even states in their guidelines that failure to apply, or incorrect application of thermal paste can potentially void the warranty of the chip. As always, thermal paste should be applied sparingly, or as Intel prefers to put it: 'Unrestrained incremental increases in thermal interface material do not translate into a measurable improvement in thermal performance'. Intel also actively discourages the use of phase change thermal materials, known to us mere mortals as thermal tape.

Heat considerations have been at the forefront of the collective Intel mind. This is evidenced by the inclusion of a heat spreader on the chip and an inbuilt thermal monitor. This thermal monitor allows the processor to change behaviour when it gets too hot. Much as laptops employ a technology known as clock modulation to reduce power consumption (the processor drops clock signals in order to conserve power). The thermal monitor is designed to run a similar process in the Pentium 4 when it gets too hot. The reduced power consumption means reduced heat output, but has a concurrent reduction in system performance. This function has to be turned on by the BIOS or in software at some point and most Pentium 4 motherboards automatically enable this feature and allow the degree of throttling back to be set.

The Evil Empire

Once you have the heat management considerations are out of the way, the other major issue with the Pentium 4 is the need for RDRAM. Because of the historical debacles with RDRAM support on Intel chipsets the very mention of memory technologies

>

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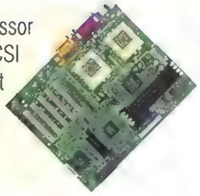

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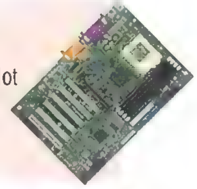

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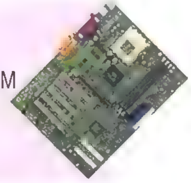

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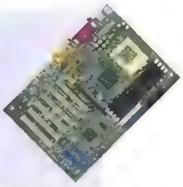

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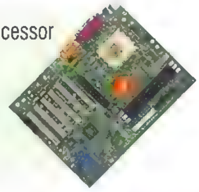

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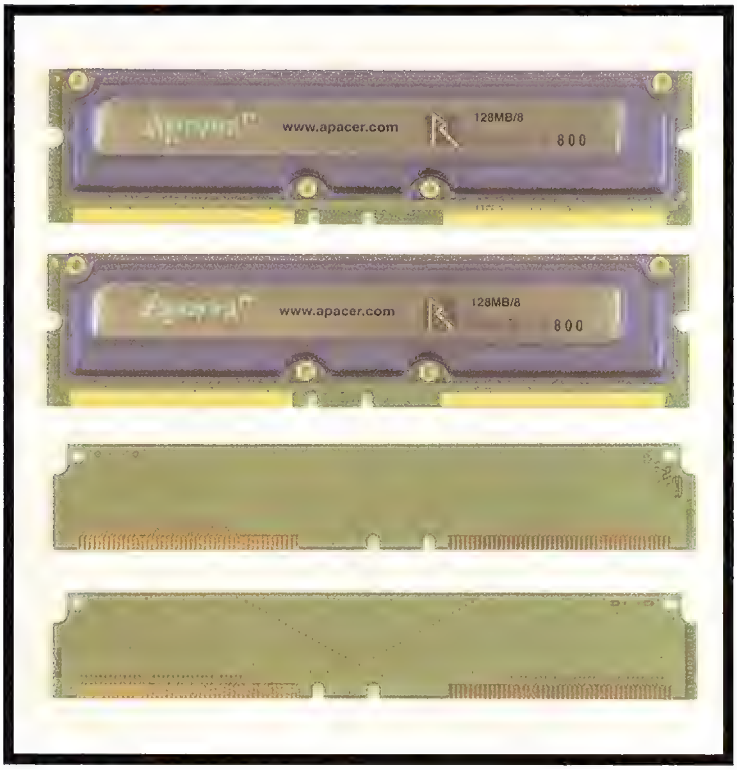


ⓘ A full set of 128MB PC800 Apacer RIMMs and the accompanying CRIMMs

from RAMBUS is enough to have you collapsed into the foetal position in the corner of the room, shaking and whimpering.

Intel see this as so much of a concern that they have adopted a practice of bundling two 64MB or 128MB RIMMS with each boxed Pentium 4.

For those who haven't dealt with RIMMs before there are some things to bear in mind. Firstly they are expensive. At the time of writing a single 128MB PC800 RIMM costs around $550 which is over $400 more than 128MB of PC133 SDRAM. The second thing is that one stick is not enough. Because of the design of RDRAM there is a need for RIMMs to be paired, much like the EDO RAM SIMMs of days gone by. But pairing them is not enough. Each i850 motherboard has four RAM slots, and because of the serial nature of RDRAM it cannot cope with empty RAM slots. To fill these extra slots there is a need to use continuity RIMMS (also known as CRIMMs or Terminators) that allow the signal to travel through these empty slots.

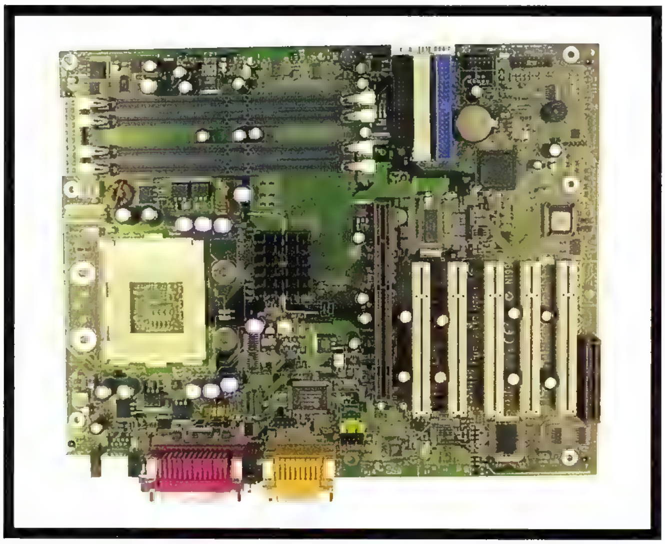
If this is not confusing enough, each motherboard has a certain way in which these RIMMs and CRIMMs must be arranged. The majority of boards require the RIMMs to be placed in the first two slots, but some boards like the Asus need the RIMMs and CRIMMs to be alternated. There is a real need to carefully read the motherboard manual when attempting to install RDRAM.

Entering the i850 world

So once you have organised your RIMMs, CRIMMs, power supply, case, HSF and processor then you can start thinking about motherboards. More P4 chipsets should be appearing soon, but for now there is still only a relatively small range of i850 based boards available.

For testing purposes we have run all boards using their default BIOS settings. The major exception to this is that on some of the motherboards an obscure BIOS setting titled Compatible FPU OPCODE is disabled by default. When this setting is disabled the FPU runs in software mode, which almost halves the performance of the motherboard. We have made sure this has been set to enabled on all the motherboards tested.

All boards have been tested using a 1.5GHz Pentium 4, 2x128MB Apacer RIMMs, a 400 watt ATX12V PSU, Hercules GeForce2 32MB, SoundBlaster Live!, 20GB UDMA 100 HDD and an Asus 12x DVD ROM. The tests have been run under Windows ME using the latest i850 chipset drivers from Intel and DirectX 8.0a. The final results have been weighted according to what tests were run and then normalised against the lowest scores in each test.



ⓘ MSI 850-Pro

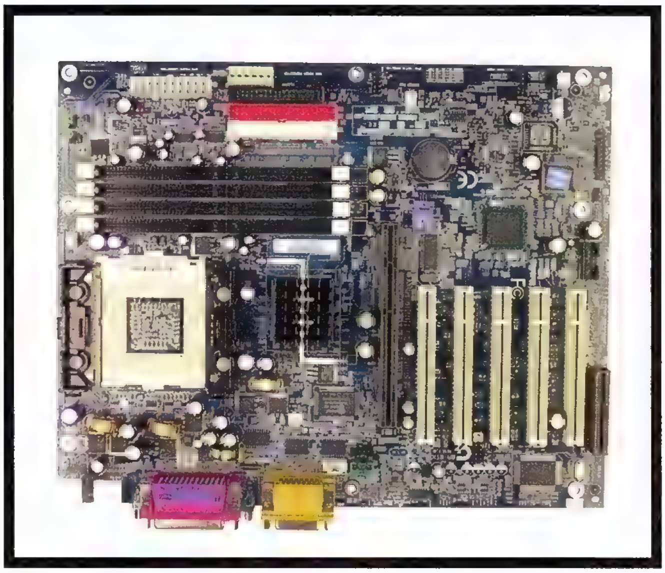
Distributer: MSI

Web site: www.msicomputer.com.au **Price:** $529.00

One of the standout features of MSI's foray into the i850 chipset is the clustering of all the power connectors in one place. Unlike the majority of boards that place the ATX and auxiliary connectors near the IDE slots, and the ATX12V connector near the processor socket, the MSI board features the connectors above the RDRAM slots.

However, the resistor and plug placing mean that connecting the Heatsink bracket is a fiddly business.

The major bonus with this board is that it uses MSI's special D-LED system, a series of four LEDs that, in combination, can be used to diagnose failures during POST. Whilst this is not as elegant as Abit's LED POST display on the TH7-RAID, it is nonetheless a very welcome feature of the motherboard. The board features two ATA100 IDE slots, four RIMM slots and an AGP Pro slot.

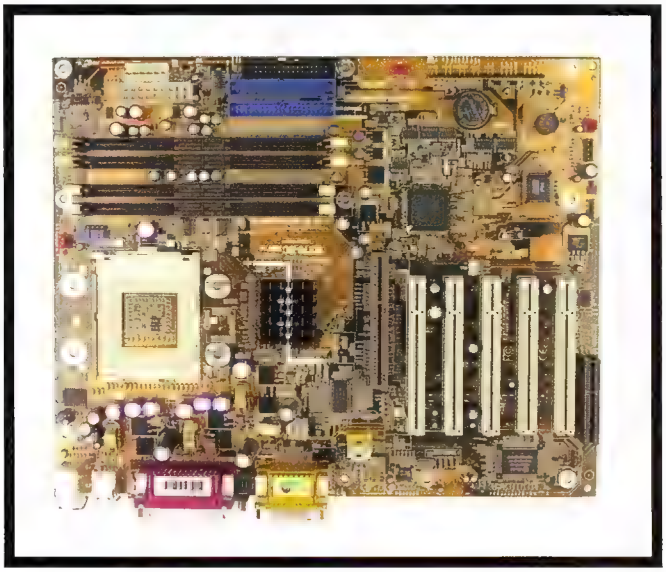


GIGABYTE GA-8TX

Distributer: Hallmark
Web site: www.hallmark.com.au **Price:** $465

Gigabyte is known for providing good quality motherboards at a low price. The GA-8TX is no exception. Although not as feature packed as other boards that we have come across, the GA-8TX does feature the now trademark Dual BIOS feature, which is useful for anyone who has failed when trying to flash their BIOS. The dual BIOS acts as a failsafe if the main BIOS dies for some reason, be it flashing related or just some undefined failure.

The board layout is similar to Intel's reference board design, but the AUX power connector on the board is placed underneath the Floppy and IDE cables, which makes for a confusing tangle of cables when the board is installed into a case. The board uses plastic plugs to connect the Heatsink brackets, which is the most common solution for HSF mounting that we have seen. It also features an AGP Pro slot, two ATA100 IDE slots and four RIMM slots.

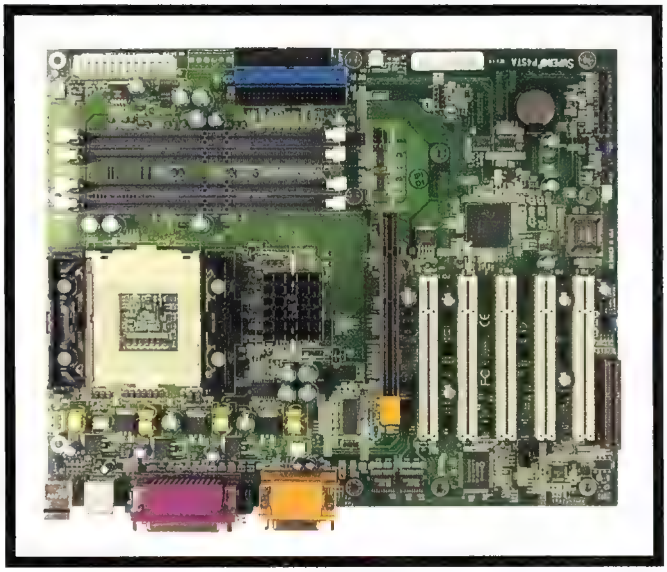


DFI WT70-EC

Distributer: DFI
Web site: www.dfi.com **Price:** $499

This is the first board that we have seen from DFI, who are a relative newcomer in the Australian market. The WT70-EC doesn't disappoint. The board has a nice clean layout, noticeably lacking the plethora of resistors that cover the other boards, making them look like the surface of the Death Star. This makes mounting the HSF on the WT70-EC a piece of cake, with none of the fiddly avoiding of resistors that comes with most of the P4 boards.

The clean layout of the board is a refreshing change. The power connectors are all very accessible and a nice touch is the different design used for the pins used to connect the case switches and LEDs to the board. This 'bent' pin layout is a flashback to the past and it makes one of the more confusing aspects of motherboard installation a piece of cake. The board includes a standard AGP slot, two ATA100 slots and four RIMM slots.



SUPERMICRO SUPER P4STA

Distributer: BCN Technology
Web site: www.bcntech.com.au **Price:** $669

Supermicro's offering in the Pentium 4 motherboard race certainly takes the prize for |337357 name. Whilst the board performs admirably, it still ends up lagging behind the other boards we have tested. The Super P4STA also is another board to suffer from the compatible FPU OPCODE being disabled by default, aside from which the board exemplifies the attention to detail and overall quality that comes with the Supermicro name.

The major divergence from the other i850 boards is the use of a 24pin SSI (Server System Infrastructure) power connector, designed for entry level servers, which can also accept the normal ATX 20-pin connectors. However, the plastic notch used to keep the power connector in place is positioned for the SSI connector and hence does not secure the ATX connector properly. The board also lacks an auxiliary power input.

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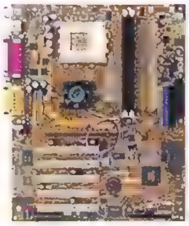

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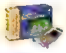

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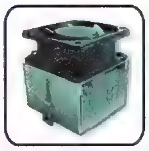

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Kingmax 128MB PC133 SDRAM DIMM	$148
Kingmax 256MB PC133 SDRAM DIMM	$348

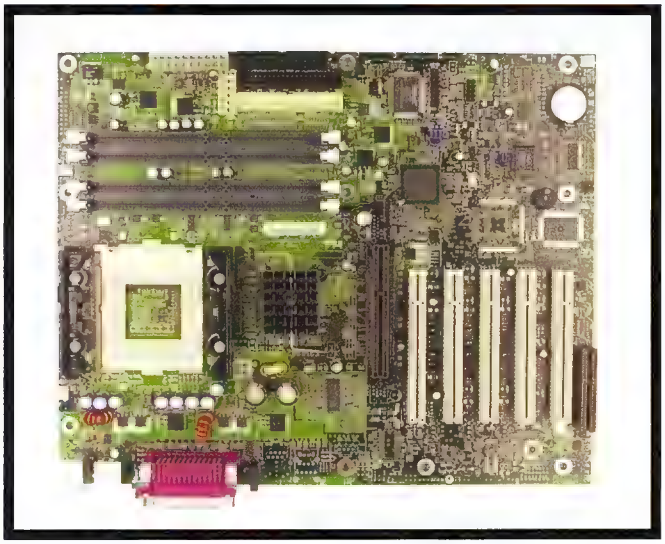
Feature Product

ASUS A7V133 Socket A Motherboard

The A7V133 is based on the VIA KT133A chipset and supports the latest AMD Thunderbird and Duron socket A CPUs with bus speeds up to 266MHz.

Includes onboard Promise ATA100 IDE RAID 0/1 controller.

or phone our sales staff on 02 6242 2777.



INTEL D850GB

Distributer: Ingram Micro
Web site: www.ingrammicro.com.au **Price:** $495

The venerable D850GB provides a solid basis for all the other motherboards on the market. All but the ASUS board are almost identical to the design of this reference board from Intel.

The power connectors on the board are quite sensible however, because it sits flush to the side of the IDE slots, care must be taken to connect the auxiliary plug before you connect the IDE cable. Apart from that the board has a clean, sparse layout.

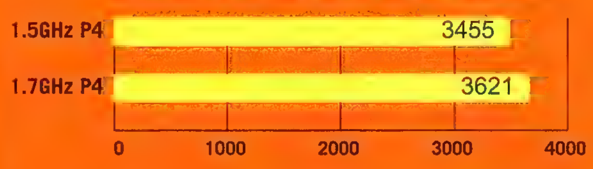
The board is a great performer, coming second in the overall result, and performing well in all of the tests that we ran. Ultimately the lack of any extra features lets the board down when compared to the bells and whistles that accompany the Asus and Abit entries in the P4 motherboard market.

1.7GHz

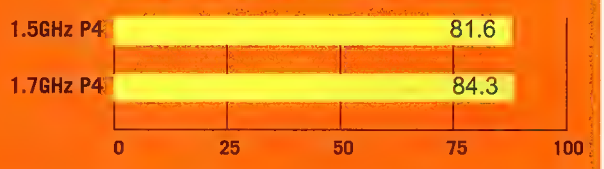
The Willamette core that powers the 1.3, 1.4 and 1.5GHz Pentium 4 processors is tipped to run out of gas in the fourth quarter of this year when it hits its ceiling of 2GHz. However Intel still have two major moves left, the as yet unannounced 2GHz model that is expected around August and the recently announced 1.7GHz model.

We ran the 1.7GHz model of P4 against its 1.5GHz sibling, using the Intel D850GB motherboard with 256MB of Apacer RDRAM and a Hercules GeForce2 GTS 32MB. Generally the performance difference varies, but in the applications benchmark, and the Sandra CPU results, the difference was generally in the range of 10 per cent. This is pretty much what is expected given the different clock speeds of the two processors. The big question is whether the Australian price of the processor will be compared to the recently announced price of $US352 in lots of 1000 from Intel. This translates to a huge drop in price over the P4 range, and it indicates the shift of focus away from the stagnating PIII towards the P4 as the flagship processor from Intel.

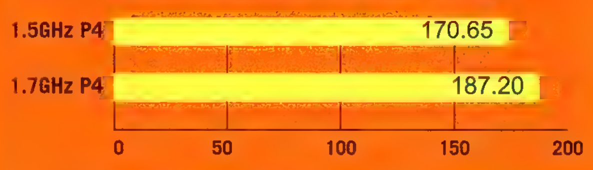
3DMark2001 Pro 800 x 600 32-bit



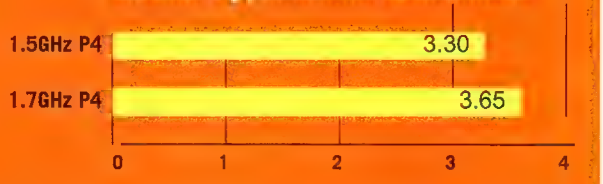
MBTR - CPU settings



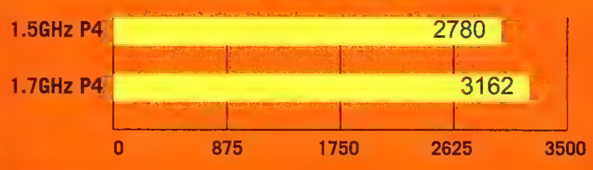
320 x 200 Q3A - CPU Settings



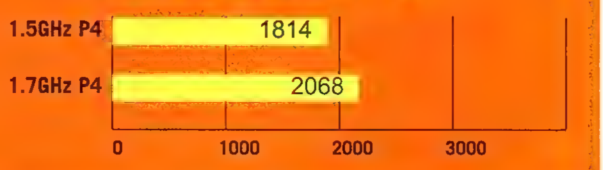
atomic Applications benchmark

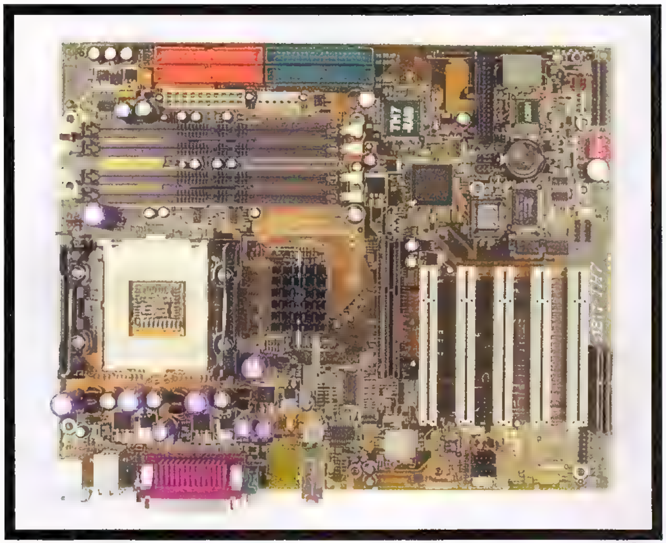


Sandra Dhrystone FPU



Sandra Whetstone FPU





ABIT TH7-RAID

Distributer: Synnex

Web site: www.synnex.com.au **Price:** $499

atomic HOT

Abit are renowned for making solid, fully featured motherboards with confusing BIOSes. The corollary to this is that they are usually the most tweakable of motherboards. The TH7-RAID is a perfect example of this; unfortunately it is also one of the boards that has compatible FPU OPCODE disabled by default.

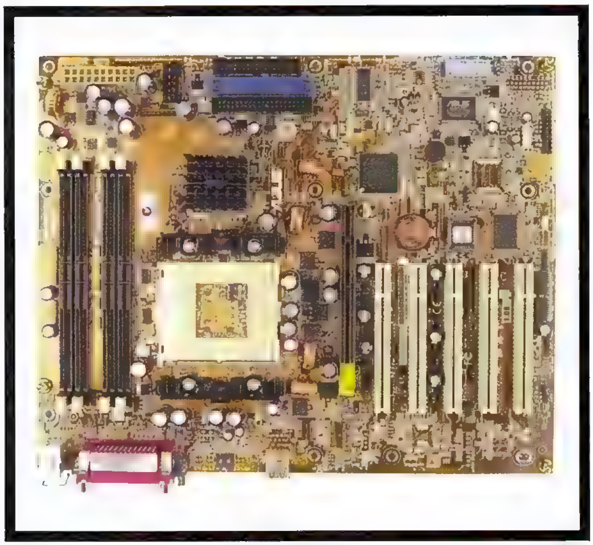
The board has a well thought out design, with some special features that will be a boon for people who love to tinker with their machines. It features an onboard LED device which gives a POST readout, which is much easier to decipher than the simpler LED solutions employed by other manufacturers. There are also onboard microswitches for Power and Reset, which is very handy for testing and for system integrators to use the board without employing the traditional "short the power switch with a screwdriver" method.

The TH-7 is the only RAID capable board in this roundup. As with all IDE RAID motherboards, this is a fairly simple solution, allowing for RAID 0/1/0+1 to be set up via an integrated Hot Rod controller. This means that there are four IDE connectors on the board, two running via the Hot Rod controller and two via the Intel ATA100 controller.

The layout of the power connectors is largely ok, however the Auxilliary connector has to be attached before the CRIMMs are inserted. Otherwise the CRIMMs prevent you attaching the AUX connector, a minor problem but an inconvenience nonetheless.

The Board comes with the Heatsink brackets attached to the board using screws. The brackets use wire Heatsink mounting clips, which are by far the easiest to use of all the clips we have come across. There is one small problem, and that is the close placement of the resistors to this bracket means that the clips can potentially damage these resistors if bent back too far, but this very much a minor niggle. The board also only features a normal AGP slot, not the AGP pro slot that is becoming common on most motherboards we see nowadays (even if the AGP Pro feature is still not required by the majority of video cards currently on the market).

The board performs well in our tests, coming a close third overall and always sitting towards the top of the performance curve. The TH7-RAID is a great performer, and with onboard RAID support and several small touches it is the most feature packed Pentium 4 motherboard we have come across.



ASUS P4T

Distributer: Cassa / Achieva

Web site: www.cassa.com.au
www.achieva.com.au

Price: $505

atomic HOT

Asus are current leaders in the performance stakes, and this translates well into their Pentium 4 offering. At default BIOS settings the P4T simply blew the competition away in nearly every test. The board's design is radically different to the reference design, placing the RIMM slots above the CPU socket, which itself is oriented so the Heatsink mounts crossways on the board.

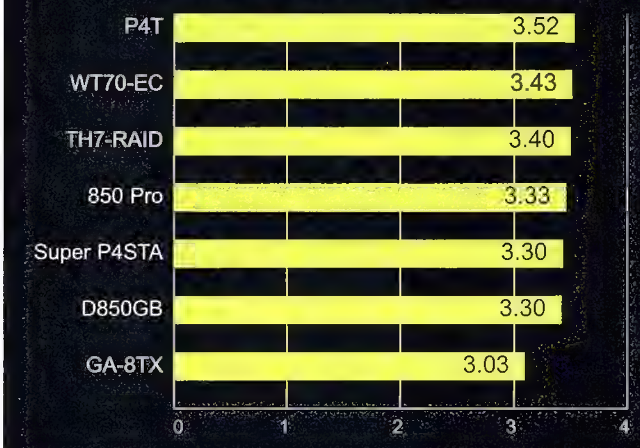
Another great aspect of the board's design is Asus' solution to the problem of bolting the Heatsink to the case. Whereas most boards either come with plastic mounting plugs (which would struggle with half a kilo of Heatsink trying to pull them out) or need a case that conforms to the new ATX standard, the P4T is designed to mount in existing cases. The way that Asus have achieved this is by supplying a metal baseplate (with a rubber insulating mat) that mounts underneath the motherboard. This bolts onto the board via screws in each corner of the board, and the Heatsink brackets bolt into this plate. The whole assembly can then be added to your existing case.

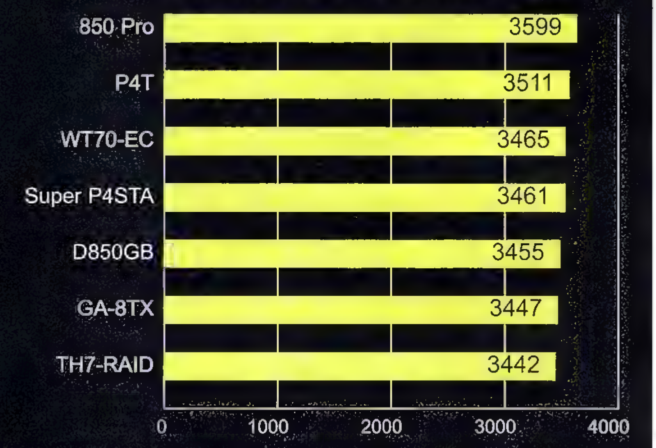
While this greatly increases the weight of the board it adds a degree of stability not seen in the other manufacturer's offering and is a very welcome bonus.

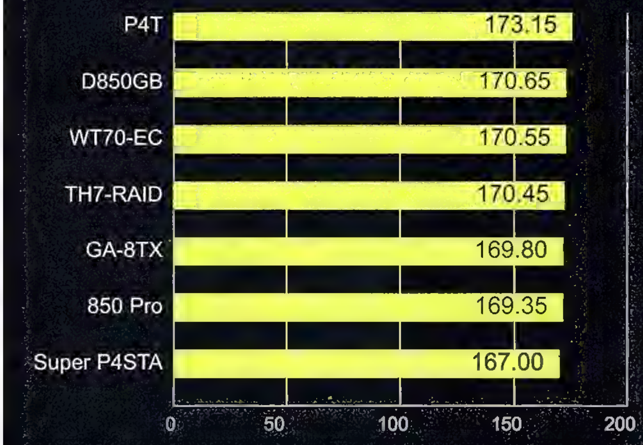
There are a few minor niggles with this board though. The placement of resistors on the board is annoying, with a tight clustering around the CPU socket. While this will not generally create a problem, it makes adding or removing the Heatsink a fiddly task. The other thing is that the pairing of RIMMs and CRIMMs makes a divergence from all the other boards we have seen. Whereas most boards require the RIMMs placed in the first two slots, and the CRIMMs in the third and fourth, the P4T needs them to be paired alternately, a small problem we know, but one to keep in the back of your mind.

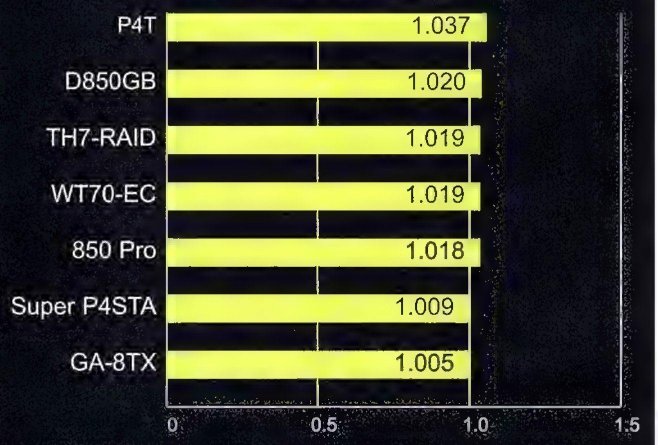
Overall, Asus have yet again delivered the yardstick board for the Pentium 4, whilst lacking the extra little touches that the Abit TH7-RAID gives us, the board performs well, and shows a commitment to user friendly design that should be applauded. >

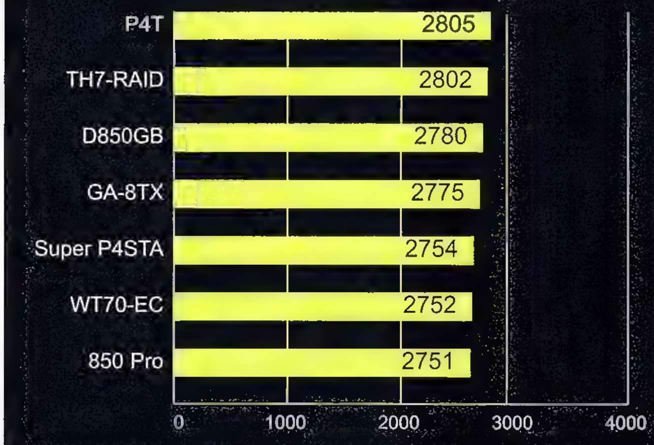
TECHNICAL DETAILS

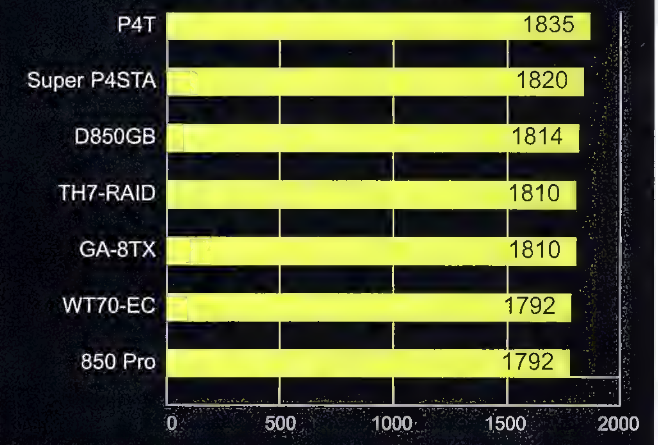

atomic applications benchmark


3DMark2001 Pro 800x600 32-bit


320 x 200 CPU settings


Normalised Overall Results


Sandra CPU Bench Dhrystone


Sandra CPU Whetstone

PRICE SHENANIGANS

Dan Rutter wonders whether consumers are the winners or losers in the price war

When the P4 first came out, it was amazingly expensive. The CPU itself was pretty darn pricey, and the motherboards weren't cheap either, but that wasn't the half of it. You were mainly paying for Rambus RDRAM, which is the only kind of memory with which the current Socket 423 Willamette P4s work. At the time, the decision to purchase a couple of 128MB modules (the P4's dual channel memory architecture means you have to buy RAM modules in pairs) would set you back by a not so modest $1800 or so.

> "Intel chipped away at the P4 price for a while after the launch, and then gave buyers a pleasant surprise when they launched the 1.7GHz P4 in April."

Unfortunately, as approximately one zillion reviewers found out, the original 1.5GHz P4 didn't fare well against slower-clocked processors. Versus 1GHz P-IIIs and Athlons using cheap SDRAM, it lost on most benchmarks.

The P4 has the potential to win by a handy margin when running software that supports its special extended instructions, but don't hold your breath for that sort of software to become the norm.

Intel chipped away at the P4 price for a while after the launch, and then gave buyers a pleasant surprise when they launched the 1.7GHz P4 in April.

Intel's thousand-unit price for the 1.7GHz P4 on launch was $US352. That was $US167 lower than the thousand-unit price for the 1.5GHz P4 it replaced as the flagship Intel chip, and it was part of a big fat across-the-board price cut.

Grey market

Thousand-unit prices, it should be stressed, don't have a lot to do with what you can buy a CPU for over the counter. They're just the official price from the CPU company to any business that puts in an order for exactly that many processors. Commonly, street prices for CPUs turn out to be strangely low when you think about the number of markups that ought to be sitting between you and this wholesale price; that's because there are all sorts of grey market shenanigans going on.

There are, for instance, dealers with stock of chips they bought at the old price, which they'd quite like to sell for a profit, if that's at all possible. They'll dump stock for what they paid for it if they find out there's a price cut coming next week. Dealers and manufacturers get better "roadmaps" of what's coming in the chip market than do consumers. So they tend to, in a way, pass on savings before they've actually made them. If they don't, they end up losing money. Bizarre, eh?

In the game of CPU price tennis between Intel and AMD, a big cut from one player's always matched by a similar cut from the other. Sure enough, about a week after the 1.7GHz P4 came out, AMD took a scythe to their official Athlon and Duron prices. The flagship 1.33GHz Athlon's price was cut almost by half, to $US183 for thousand-unit quantities.

The DDifference

PCs based on a 1.33GHz Athlon are, from a user's perspective, much the same as PCs based on a 1.7GHz P4. The Athlon wins by a bit on most tests if it's got Double Data Rate (DDR) memory, and loses by a bit if it doesn't, but without using benchmarking programs it can be hard to pick the difference for the majority of desktop computer tasks, including games. But, thanks to the current price cut matching, the component prices for these systems continue to be quite different.

You'll only notice this if you're looking at the price of the separate components at all, though. Most people who buy a P4 don't have much of a clue what the parts cost, because they buy their processor as part of a pre-built brand-name system, which may be surprisingly cheap.

The reason it's surprisingly cheap, of course, is that it'll have one of the lower speed P4s in it - a 1.4GHz, maybe a 1.5, maybe the poor little 1.3 - and cheap PC600 or PC700 RDRAM. Slower memory hurts the P4's performance quite severely, and can put it on par with far cheaper Athlon, Duron, P-III and Celeron boxes, running dirt cheap Standard Data Rate (SDR) SDRAM.

What's all this mean? Well, it means that if you've got your heart set on a P4, you can get your toy for less now. Some dealers even have RDRAM at less than preposterous prices now, though you can still pay $900 for 128MB if you pick poorly. Just remember that you also need to fork out around $500 for a motherboard.

But it also means that if you've got no particular CPU preference, the Athlon continues to be a great alternative to the P4.

reviews

atomicreviews

HARD WEARING

Have you ever read the hardware requirements on the side of a game's box? 99.99 per cent of the time the specifications listed are about as believable as a politician's promises during election time. Rarely, if ever, are accurate hardware requirements listed on the box, and I believe that the reason for this is that most games demand a PC far in excess of the standard PC at the time of release.

It seems that most publishers don't realise the anger they cause through the use of deceptive hardware requirements. But I'm sure you've all felt it, ripping off the shrink wrap from your hot new game, only to watch it deteriorate into a crappy slideshow on the PC you once thought was top of the line. Sure, tweaking the hell out of it will get it running smoothly, but you generally end up with a game that doesn't resemble anything like the scrumptious shots on the back of the box.

The prime example of this would have to be Falcon 4. Released around three years ago, the system specifications list a 266MHz CPU as optimal. So why is it that three years later, my 1GHz machine still doesn't have the oomph to play the game smoothly when in campaign mode? It is obviously a very CPU-centric game, as with each increase in CPU speed I've had, the frames per second have increased.

At the risk of upsetting a lot of people, I'd have to say that even Half Life's hardware requirements were a joke at the time of its release, and it took me three upgrades of my CPU and video card before I could get the game to consistently run smoothly online at high detail settings.

A more recent example that springs to mind is Tribes 2. At home, I run an Athlon 900MHz overclocked to 1GHz, with 192MB of PC133 SDRAM and a 32MB GeForce 2 GTS. Most people would consider this to be a fairly hefty system, and I know I have it set up perfectly, due to months of benchmarking and tweaking. So why is it that Tribes 2, which doesn't have a particularly spectacular graphics engine, requires me to lower the graphics options so much?

I even whacked in a 64MB GeForce3 and an extra 128MB of SDRAM to see if it would help, but with all settings maxed at 1,024 x 768 resolution, the fps still dipped to around 15 fps when there's a lot going on. I still love Tribes 2 and play it every night, but it angers me that the game I am forced to play looks only slightly better than the original Tribes, and nowhere near as good as the luscious screenshots on the box that enticed me to lay down my cash.

People wonder why most games don't have a built in benchmarking mode, or frame rate counter at the very least. You'll probably notice that the majority of the games that do include these have engines that run well on a medium range system. It seems as if the developers figure no one will notice substandard frame rates if the game doesn't have an fps counter. Well, I'm here to say that we're not quite as stupid as they believe.

It's time things changed. The lies of the PR goons who dream up these ridiculously low hardware requirements are one of the greatest aids in the next-gen console's bid to usurp the PC as the ultimate gaming rig. One of the best things about consoles is that you know the game is going to run smoothly when you get it home, whereas on the PC you only know how well it is going to run after you've already spent your $90 and several days trying different obscure tweaks to raise the game's performance.

What we need is a standard benchmarking program for games performance, similar in concept to 3Dmark 2000, but one that uses all of the popular graphics APIs. This program should be free to download, and give the user a single score.

On the game packaging, a message along the lines of 'You must have a 3DGame Mark score of 6,000,000,000 or above to run this game at a minimum of 30fps, all settings maxed, at 640 x 480. A 3DGame Mark score of 12,000,000,000 or above is required to run this game at a minimum of 30fps, all settings maxed, at 1,024 x 768'. It wouldn't take up much more space on the box, and you'd have a lot less pissed off gamers in the world.

Unfortunately it's never going to happen. If it did, no-one would buy any of the games that require hardware a few years away to run smoothly, which unfortunately seems to be the majority of them.

The only thing we can do is vote with our dollars, buying those games with engines that are coded to run well on today's hardware. There are games out there that have been coded like this, with Serious Sam being a great example.

Unfortunately, our insatiable desire for eye candy will keep us all buying the games that look amazing but run as quickly as a drunken sloth. So we'll upgrade to get it running well. Then a new game will come out that requires us to upgrade again, so we'll part with some more of our hard earned dollars. Before you know it, another beautiful game comes out and you need to upgrade again, and then another game comes out...

Bennett Ring

atomic benchmarks

Take a look inside the atomic Labs testing procedures

Here at atomic it is our primary intention to give you the final word on the latest in hardware and PC technology. An integral part of determining the performance of a particular piece of hardware is benchmarking - and this is something that we take very seriously in the atomic Labs.

atomic Applications Benchmark

The atomic Applications Benchmark suite uses an assortment of off-the-shelf applications and is an excellent test of a system's overall performance, including CPU, RAM, hard disk and graphics card, when running conventional 2D programs. Desktop resolution set to 1,024 x 768 at 32-bit colour, DMA enabled, latest drivers for all hardware including chipset inf updates.

SiSoft Sandra 2000 Professional

Sandra, from SiSoftware (www.sisoftware.co.uk) is a comprehensive benchmark and diagnostics utility. It contains dozens of special module applets that retrieve detailed information about the specification and settings of a system by polling each component's built-in firmware or BIOS. Sandra also features a small suite of synthetic benchmarks for specific components such as CPU, memory, CD-ROM and hard disk.

3DMark2000 Pro

3DMark2000 Pro from MadOnion (www.madonion.com) is a powerful benchmark for testing Direct3D performance, and is the successor to the popular 3DMark99 MAX. Although it is a synthetic benchmark, it uses the advanced Max Payne 3D engine which is representative of the latest in Direct3D performance and technology.

3DMark2001 Pro

3DMark2001 Pro from MadOnion (www.madonion.com) is the next progression of the popular benchmark. It also uses the MAX-FX engine from Max Payne and heavily emphasises DirectX 8 functions including programmable shaders. The results are not comparable with 3DMark2000 Pro results.

Quake 3: Arena

Quake 3: Arena, from id Software, is the extremely popular first-person shooter that represents the latest in OpenGL gaming technology. Q3A has a built-in benchmarking utility and some built-in demos that can be used to test graphics card performance. These demos are fairly simplistic, however, and are not representative of the worst conditions that the game can offer to a graphics card, so we developed our own atomic demo that pushes the hardware as far as possible.

Other Benchmarks

Sometimes we need to break down the tests into more specific areas, such as hard disk performance, or a particular facet of 3D, like transform and lighting or SSE. For this we can draw upon a vast number of applications, games and dedicated benchmarks for these specific purposes, such as CD Speed 99, Evolva, MDK2, Adaptec Threadmark or Mercedes Benz Truck Racing. Whenever we use one of these special benchmarks we will outline the nature of the tests, the testing procedures as well as any settings that we use.

atomic Testbench specs

There are two testbenches in the Labs, one for running AMD processors and one for Intel processors. Both are running Windows ME, DirectX7.0a or DirectX 8, Liveware 3.0 for Windows ME and Detonator 6.50 reference drivers. For your reference, in all our benchmark tests we have included yardstick scores showing how our two testbenches perform in that test.

- AMD Athlon Thunderbird 1GHz system – ASUS A7V motherboard
- Intel Pentium III/1GHz system – ASUS CUSL2 motherboard (Both supplied by CASSA, (07) 5445 2992, [illegible])

Common Components

- Transcend 128MB PC133 CL2 SDRAM (Supplied by CASSA)
- Transcend 128MB PC2100 DDR RAM (Supplied by CASSA)
- Hercules Prophet II GTS 32MB (Supplied by Guillemot, [illegible])
- SoundBlaster Live! Player (Supplied by Creative Labs Australia, [illegible])
- ASUS 12x DVD-ROM (Supplied by CASSA)
- 7,200rpm UDMA100 20GB hard disk
- Floppy drive
- 350 watt PSU

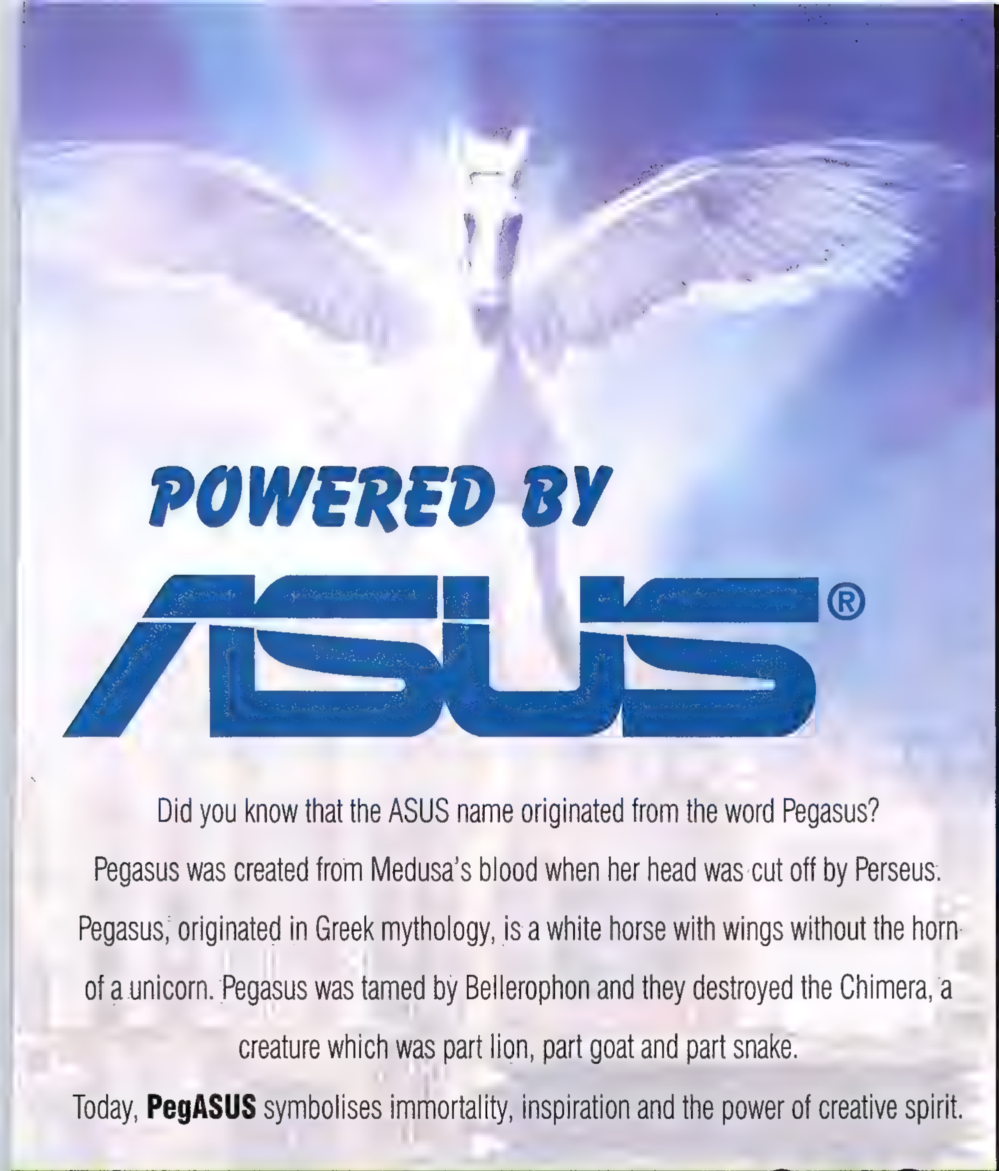
Benchmark settings

3DMark2000 Pro

- 1,024 x 768, 16-bit colour, 16-bit textures, 16-bit z-buffer, triple frame buffer
- 1,024 x 768, 32-bit colour, 32-bit textures, 24-bit z-buffer, triple frame buffer
- 1,600 x 1,200, 16-bit colour, 16-bit textures, 16-bit z-buffer, triple frame buffer
- 1,600 x 1,200, 32-bit colour, 32-bit textures, 24-bit z-buffer, triple frame buffer

Quake 3: Arena atomicmpc demo
All tests use Quake 3 version 1.27g

- CPU: 320 x 200, max geometry detail, lowest graphics settings, high sound quality
- Graphics cards: 640 x 480, normal quality graphics settings, high sound quality
- 1,024 x 768, all graphics settings maximum, high sound quality
- 1,600 x 1,200, all graphics settings maximum, high sound quality



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Did you know that the ASUS name originated from the word Pegasus?

Pegasus was created from Medusa's blood when her head was cut off by Perseus. Pegasus, originated in Greek mythology, is a white horse with wings without the horn of a unicorn. Pegasus was tamed by Bellerophon and they destroyed the Chimera, a creature which was part lion, part goat and part snake.

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Look out for the ASUS V7700 GeForce 2 Ultra pushing the boundaries with one billion pixels per second using the 64MB Double Data Rate (DDR) memory operating at an ultra speed of 460Mhz.

Top this off with the ASUS A7M266 using the AMD 761 and VIA 686 chipset. The A7M266 features the competition-blowing DDR DRAM capability with AGP Pro slot and ATA 100 Dual Channel interface. **Want more?** Then visit our website at www.achieva.com.au and fly with ASUS.

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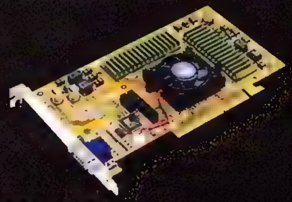
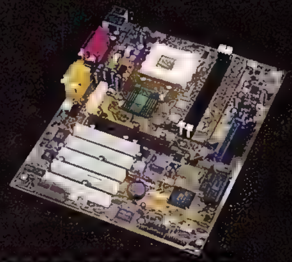


**ASUS V77oo
GeForce 2 Ultra**

- Powered by NVIDIA's GeForce2 Ultra™
- 460MHz (230MHz DDR) 64 MB DDR video memory 0.18u process
- 250MHz engine clock
- 460MHz (230MHz DDR) DDR SDRAM video memory 7.36GB per second

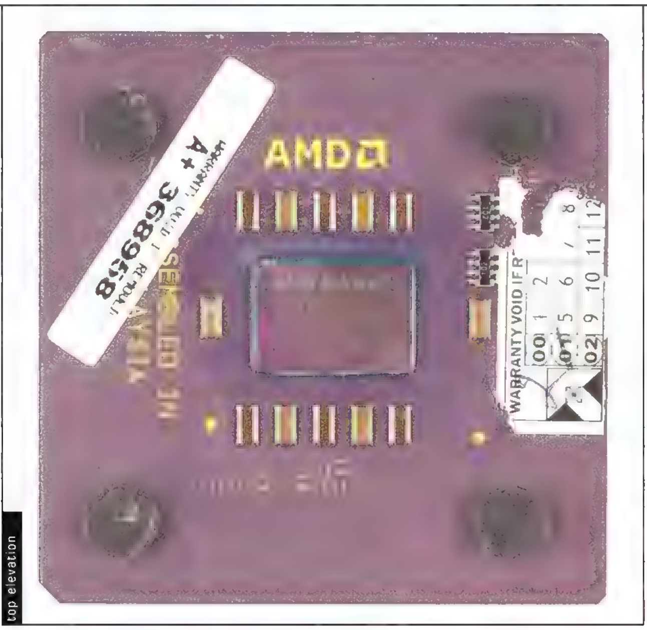


ASUSA7M266
MOTHERBOARD
for Socket A AMD Athlon/Duron

- 266 MHz bus speeds and PC1600/PC2100 DDR SDRAM
- AMD® 761 North Bridge and VIA® VT82C686B South Bridge
- Up to 2Gb of DDR SDRAM
- Overclocking bus speeds of up to 360MHz (180 x 2)
- Jumperfree™ Mode
- Manual overclocking with dip switches
- 3COM® 10/100Mbps Ethernet controller
- AGP Pro slot for AGP Pro, AGP4X and AGP2X cards
- ATA-100 backward compatible to ATA-33 and ATA-66
- 5 PCI slots, 4 USB ports and AMR slot
- ASUS® iPanel support

AMD 1GHz AXIA Athlon

Bennett Ring finds overclocking Nirvana



It looks as if the 300A of the 21st Century has arrived, in AMD's latest refinement of the Thunderbird Athlon core. The AXIA Athlon has landed and the lads in the labs are in love.

When a CPU manufacturer makes small enhancements to a CPU architecture, it is known as a new 'stepping' of that design. These are usually recognisable by a serial number or code printed on the top of the die of the CPU.

If you take a quick look back at last month's 1.33GHz Athlon review, you'll notice the letters AXIA on the top of the CPU. We managed to squeeze 1.5GHz out of this baby, but didn't realise that the AXIA code was significant. Since then, it has become apparent that the AXIA stepping Athlons are the most overclockable AMD chips to ever hit the overclocking scene.

An annoying feature of our 1GHz AXIA Athlon was the 'Warranty Void If Removed' sticker covering the severed L1 bridges on the chip. After uncovering the L1 bridges and voiding our warranty, we soon had our CPU multiplier unlocked.

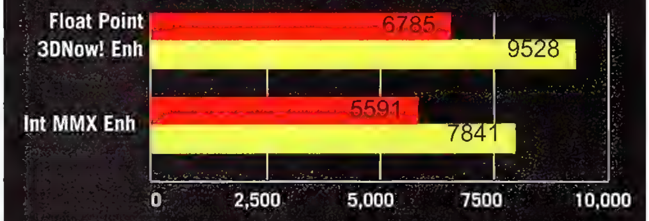
The 100MHz FSB AXIA Athlons are the best chips to use for overclocking, as you can simply place them into a 133MHz FSB KT133A based motherboard and, using the default multiplier of the chip, you'll get a quick and easy 33% overclock. We did just this with our AXIA, placing it into an Aopen AK-73Pro(A) 133MHz FSB motherboard. The machine promptly booted at 1.33GHz without a problem.

After upping the voltage to 1.85V, we were able to load Windows at a speed of 1.46GHz (11x 133MHz FSB), but couldn't get the chip to successfully complete any benchmarks. We then lowered the multiplier to 10.5, and settled in for some benchmarking at a speedy 1.4GHz. The chip ran superbly, without a single crash during all of our benchmarks.

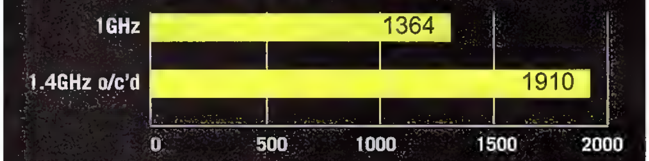
Many users have reported speeds of 1.5GHz to 1.6GHz with the AXIA, and as a result they are quickly becoming highly sought after. Remember when you track one down to check for the AXIA code on the top and get the 100MHz version. At around $350 for a chip that reaches such high speeds, there really isn't an alternative CPU that deserves your money more. ▢

TECHNICAL DETAILS

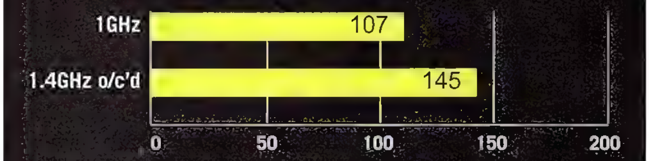
Sandra CPU Dhrystone ALU



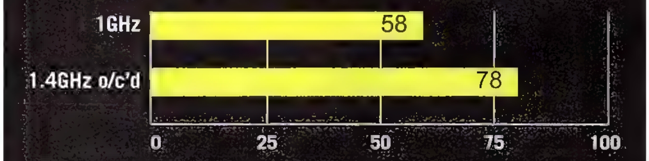
Sandra CPU Whetstone FPU



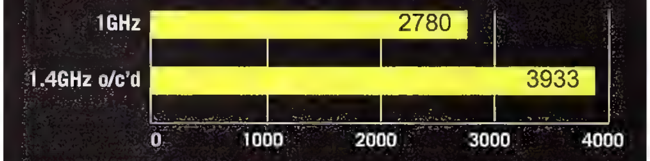
MDK2 CPU settings



Q3A atomic demo, CPU settings



Sandra CPU Dhrystone ALU



KEY TO ATOMIC GRAPHS

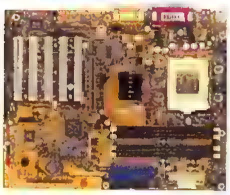
🟨 1 GHz

🟥 1.4GHz

850 Socket 423

Pentium® 4

WT70



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- 5 PCI slots/ 1 CNR slot/ 4 USB ports
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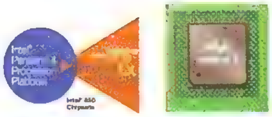
- AC'97 sound
- ATX form factor



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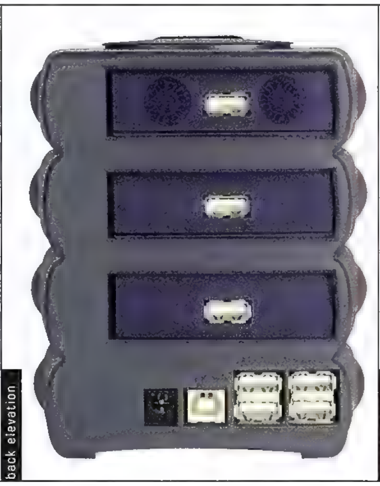
Fax:(02)9659-8855

USB Bus Station

Need more funky-looking useful stuff around your box? David Kidd has a new toy

front elevation


back elevation

top elevation

Since the days of configuring IRQs, DMAs and COM ports we have yearned to just plug the damn thing in and be done with it. The universal compatibility of USB highlights a major leap by technological and industrial standards, making our PCs significantly easier to expand, upgrade and modify. For many, the standard dual port at the rear of the computer gets used up immediately and they'll be searching for more USB ports. As far as USB hubs go, they either work or they don't. They give us more ports, they can be chained together to give us even more ports and they work off a single USB port. There's little variation on this basic theme except some might offer some blinking lights and usually provide an external power supply. The question then is what can a manufacturer possibly offer in a standard hub? The USB Bus Station from Belkin attempts to not only provide a fully featured hub but to fulfill those promises that USB gave us all those years ago.

In its simplest form, the USB Bus Station is a standard 7-port USB hub. Unlike most hubs that resemble a modem, the Bus Station stands in an upright position at just under 13cm tall. Although many features indicate portability, the size and awkwardness of the unit limit it to desktop status. There are four sections to the Bus Station, with three removable modules stacked on top of the base section. Each of the three removable modules consists of a single USB port while the base contains the remaining four. The base also houses seven LED activity lights along the front. The only real problem I have with the unit however is the strict rear placement of the ports on all modules. Granted this is only an issue when attaching game devices, however the option of front side ports would have been a welcome inclusion.

The Bus Station requires no drivers and as such was completely plug and playable, although I'd expect Windows 95 users may run into problems. Although drawing power from the PC USB port, the base section also houses an external power supply. Unless heavy duty USB usage is required, the additional power typically isn't used due to the rather frugal use of power from common USB devices like keyboards and mice. Each module can be detached from the unit and used separately and, although having a module with a single USB port is completely useless the great possibilities of the 4-port module are apparent.

Out of the box, the Bus Station is an expensive, yet funky 7-port USB hub. The usefulness however comes with the modular design. Modules can only be changed from top to bottom and can be removed by pushing the module from the back. Unfortunately, the modules felt a little too tight and pushing them strained the plastic mould of the entire unit, taking some patience before the module could be 'worked' out of the slot without snapping the plastic.

This adventurous design could only be marketable if it was accompanied with a wide range of practical and affordable modules. Belkin has delivered in this department giving its Bus Station users access to most common device adapters. In addition to providing 4-port USB modules, a PS/2 to USB module is available for possible laptop mouse/ keyboard configurations while USB/Serial modules provide options for PDA users. SCSI devices can also take advantage of the Bus Station with SCSI to USB modules, which do not require any additional SCSI controller cards. Finally, Belkin has provided an Ethernet module to provide network capability without additional PCI usage. This range of modules should suit most common systems and the optional pretty coloured modules should keep the Mac users amongst us happy.

Although this offers a wide array of customisable configurations with the Bus Station, the modules can also be used separately, making up for the lack of portability. The cabling issues one would expect to see in hub chains is nowhere to be seen due to the simple slot-based design.

Overall, the Bus Station is definitely not for everyone. As a 7-port hub, there are much cheaper options available and the extra modules will further bump up the cost. However, the big selling point is the expandability and customised possibilities, which finally fulfill not only our USB expectations, but also our FireWire, Ethernet, Hi-speed USB, SCSI needs as well, all packaged into something that will impress.

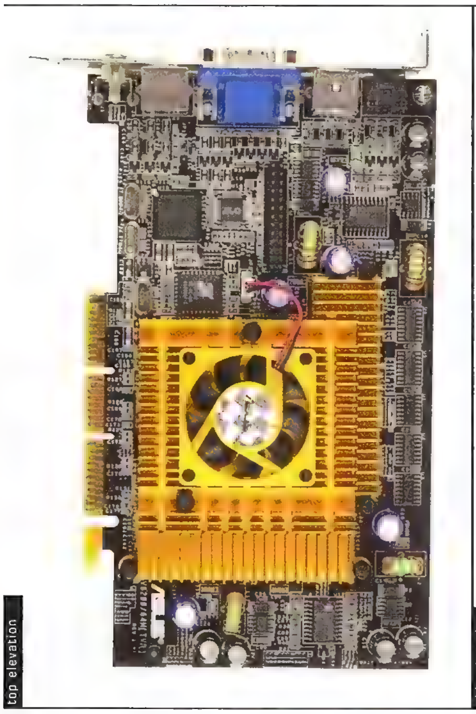
SPECIFICATIONS

7-port USB hub, 3 removable 'modules', USB 1.1 compliant
Requirements: Win95/98/2000; MacOS 8.1 + 1 available USB port
Web site: www.belkin.com **Price:** $199.00

atomic
8/10

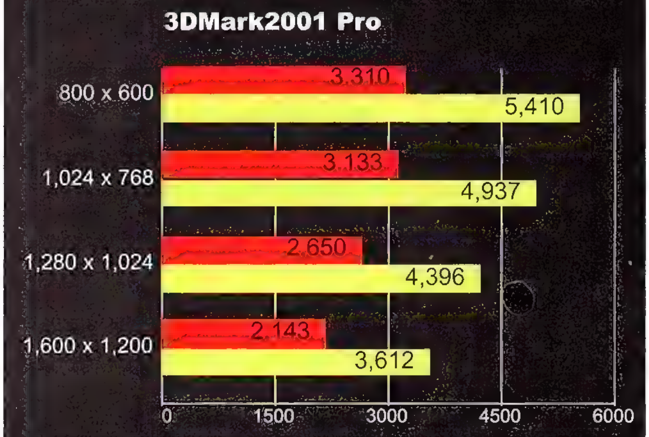
Asus V8200 Deluxe

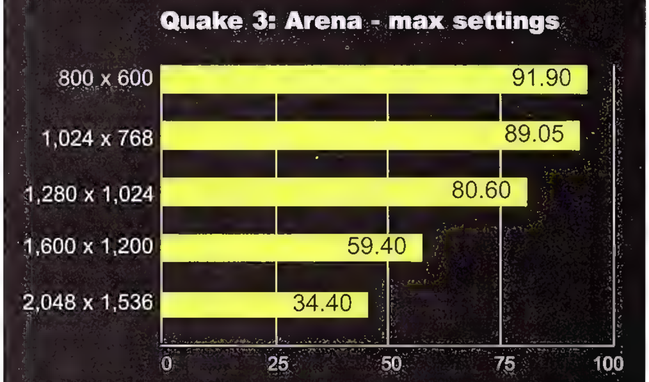
John Gillooly wipes the drool from Asus' latest graphical beast


top elevation

side elevation

TECHNICAL DETAILS





KEY TO ATOMIC GRAPHS

🟨 ASUS A8200 Deluxe

🟥 GeForce2 Ultra

The release of the GeForce3 has been marred by design problems in NVIDIA's early cards. These cards performed quite well, however none of us at the atomic labs were prepared for the extra performance leap that would come with production models of the GeForce3.

Asus have the honour of supplying us with the first of these production models that we have seen, and what an amazing card it is. The Asus V8200 Deluxe quite simply blows any other video card we have seen out of the water. Add this phenomenal performance to the extra features that mark Asus' deluxe card and you have the ultimate in video hardware, for a price.

The price of the GeForce3 seems to be the major factor holding people back, and for those who forked out a pile of cash for the previous generation GeForce2 cards may not see the need for an upgrade so soon, but for anyone else that is in the market for a new video card then this is definitely an option.

When you realise that for the price you get a huge performance boost for your existing games, playable high resolution anti-aliasing, video in, video out, 3D glasses, a fully backwards compatible T&L engine, plus the next generation of programmable T&L then the proposition seems a little bit more reasonable, and you can overclock the memory and the chipset of the card by about 20 per cent.

We tested the card using the 12.00 Asus drivers on our Athlon testbench. In the end we needed to swap to a better monitor, purely in order to be able to push the resolution to the maximum. Of our results, perhaps the most stunning is the 2,048 x 1,536 Quake3 test. The game manages to run at playable speeds at this astronomical resolution, and at the lower 1,600 x 1,200 resolution it flies along with frames to spare.

This is one of those cases that we will let the rest of the numbers speak for themselves, with this card running on an overclocked P4 1.5GHz @ 1.87GHz we managed a 3DMark2001 score of 6,579, and the results on our Athlon testbench are equally impressive. This card truly delivers a quantum leap in 3D performance, with features to match. ▢

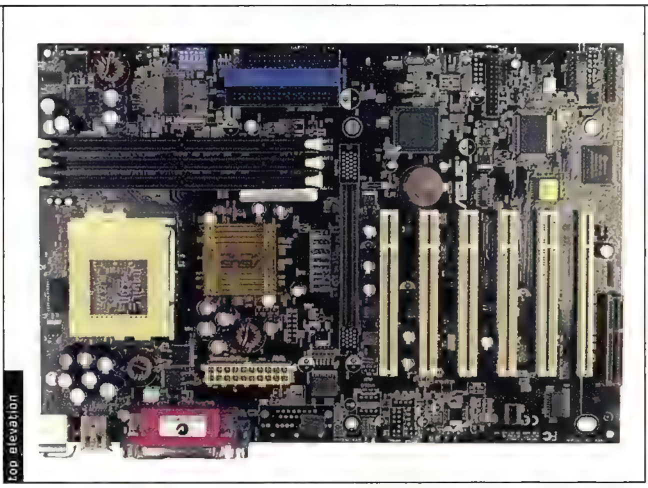
SPECIFICATIONS

NVIDIA GeForce3 GPU, 64MB DDR RAM, D-Sub output, TV Output, Video Input, 3D Glasses, ASUSDVD software, 3Deep, Ulead Videostudio, Star Trek - Elite Force game

Web Site: www.cassa.com.au **Price:** $1,099

atomic
9.5/10

Asus CUSL2-C Black Pearl



The CUSL2 motherboard from Asus has proven over the last six months to be one of the fastest motherboards available for users of Intel PIII and Celeron CPUs. We like it so much that it is the standard motherboard for all of our benchmarks in the atomic labs that require Intel CPUs. Asus soon released an even better version of the board, known as the CUSL2-C, which received widespread acclaim. Capitalising on this successful series of motherboards, Asus have released a special edition of the board, known as the Black Pearl.

The first thing you will notice when looking at the board is its striking appearance. Finally, a motherboard manufacturer has realised that we don't particularly like the booger green that most PCBs are made with. The Black Pearl is, surprisingly, a lovely deep glossy black. The Northbridge is covered with a custom Asus golden heatsink, and the overall sexiness of the board makes it perfect for those who wish to display the guts of their beast to the world.

Other than these superficial changes, there's not much else that's different with the board from the standard CUSL2-C. An additional set up manual is included that is very easy to understand for the novice builder, as well as a custom Asus multihead screwdriver. Another novel feature of the board is its customisable boot screen logo utility, allowing you to easily display your own graphic when booting up.

The Black Pearl is also one of the first motherboards to support the Asus Read2-In-01 SmartCard reader, which makes you insert a SmartCard before the machine will power up.

If you are looking at buying a new Socket370 SDRAM motherboard, the Black Pearl is the most well-rounded and attractive motherboard available. This does come at a slightly higher price than many similar Socket370 boards, with an RRP of $315, but if you've got the cash this board definitely warrants your attention.

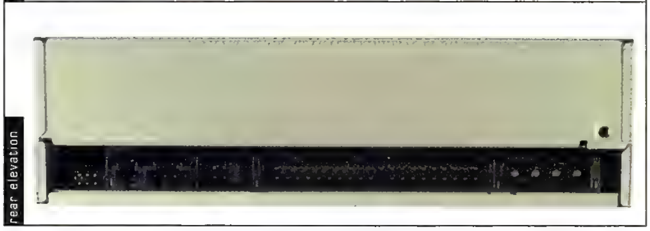
SPECIFICATIONS

3 x PC100/133 DIMM up to 512MB; 6 x PCI slots; 2 x UDMA/100 IDE ports; i815EP chipset; 4x AGP; Jumperfree BIOS FSB and Vcore adjustments

Web site: www.asus.com **Price:** $315.00

atomic
9/10

ASUS CRW1210R CD-R/CD-RW



If you're shopping around for a new CD-R/CD-RW drive, you'll most likely be after a 12x, as these are now becoming very affordable. The latest 12x CD burner to grace the atomic labs is the CRW1210R from Asus, which utilises the impressive Just Link technology.

One of the most common problems CD burners suffer from are buffer underruns. These occur when the PC can't feed information to the burner at a rate fast enough for the burner. Therefore the burner needs to pause its job while a buffer is filled with information that is to be written to the CD. The beauty of Just Link compared to other buffer underrun prevention techniques is the small gap it creates between where writing was paused and then resumed. Compared to the other techniques used, the gap created with Just Link is approximately twenty times smaller. This lowers the possibility of playback problems with the disk.

We tested the drive's audio transfer speed using CD Speed 2000, and the drive performed to its advertised specifications, returning an end speed of 32.42x, using CAV (constant angular velocity). Using the same benchmark, the drive returned a burning speed of 12x using CLV (constant linear velocity), just as promised. Data transfer speed benched at 30.94x, while the total time taken to rip a 74 minute audio CD was 195 seconds.

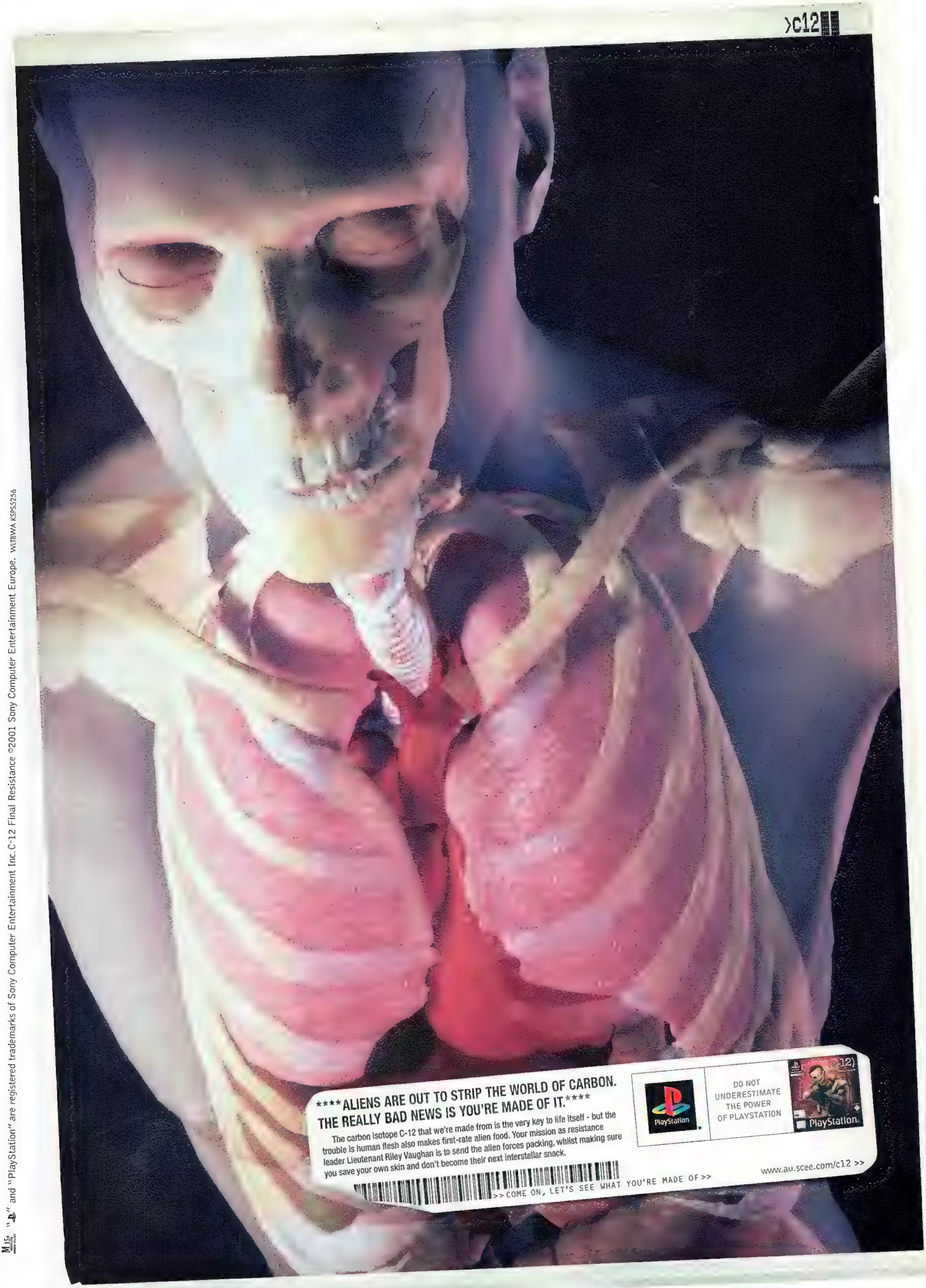
At approximately $489, the Asus CRW1210R is slightly more expensive than some of its competitors. However, the drive does perform exactly as advertised, and the innovative Just Link technology should ensure that backing up will be more reliable than ever.

SPECIFICATIONS

12x Write, 10x Re-write, 32x Read, Bundled with Nero burning software, 9 x 16x CD-R blanks, 1 x 10x CD-RW blank

Web site: www.asus.com.tw **Price:** $489.00

atomic
8.5/10



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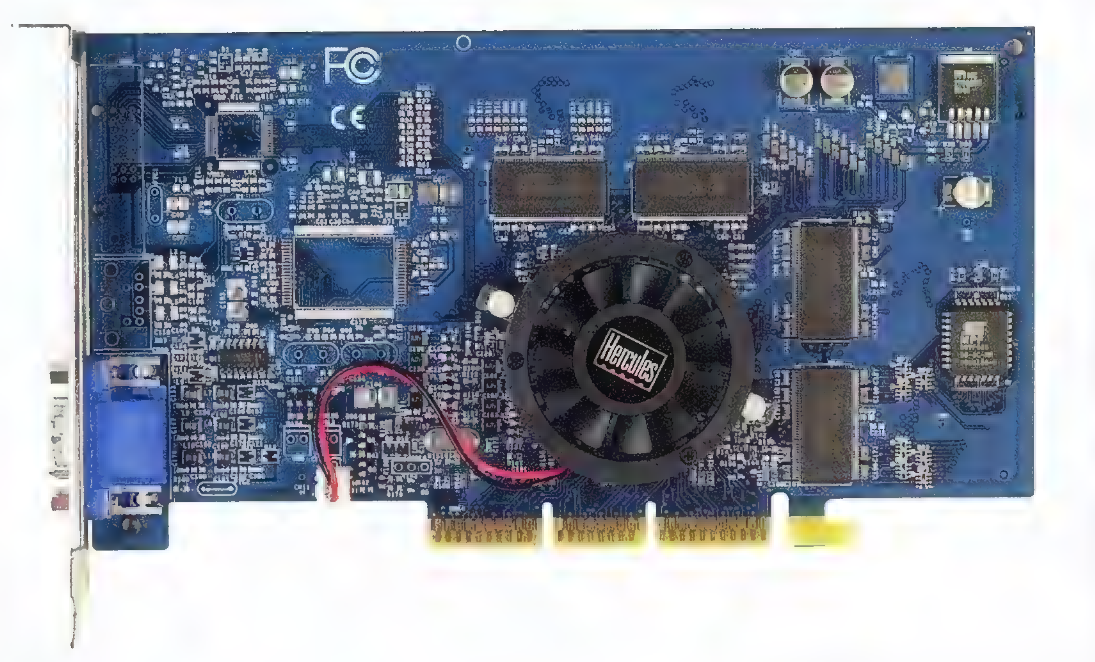
Hercules 3D Prophet 4500 64MB

John Gillooly takes a tentative step outside the NVIDIA world



front elevation

side elevation

At atomic we don't like to use the term Hoopla too often, but there has been an awful lot of Hoopla about Hercules' decision to move towards the KYRO II as their choice of budget range video chipset. In a market that NVIDIA has sewn up, it is a brave move by a manufacturer the size of Hercules to make a move to another graphics chipset supplier.

The reason that Hercules has the balls to stand up to NVIDIA is their huge share of the graphics market in Europe, and the perception that this will mean that there will be none of the backlash that has plagued other manufacturers when they made noises about a move away from NVIDIA.

NVIDIA are worried, something that was displayed in a leaked PDF (designed for internal sales use) that appeared on the Web before being hastily taken down. In this document NVIDIA employed every dirty trick in the book to scare customers away from the KYRO II, an acknowledgement that this was an actual internal NVIDIA document was a big surprise to all those who thought that the document was written by a five year old.

The Hercules Prophet 4500 is the name given to the new underdog in the graphics card business. So far only Hercules, Videologic and Innovision have committed to producing KYRO II based cards, and Hercules are first off the rank in the atomic labs, mainly due to their working closely with STMicroelectronics to develop the card.

The KYRO II is essentially a higher clocked version of last year's KYRO chipset. The card uses tile-based rendering and does not have a hardware T&L unit, unlike the GeForce series of cards. This is somewhat surprising, considering that the common expectation was that the next iteration of the KYRO would include T&L. Instead STMicroelectronics have focused upon delivering a high performance, no frills, tile-based renderer.

We could reasonably expect to see a T&L unit in the next chipset from STMicroelectronics, mainly due to the fact that their Naomi2 arcade machines contain one on a separate chip. However, this still needs to be integrated into the KYRO core, something made more difficult by their use of tile-based rendering rather than more simple methods.

The KYRO II is pitched at the budget market (admittedly at the higher end of it), largely because tile based rendering is much more memory efficient than traditional rendering methods so the card does not need the exotic high speed DDR memory or high core speeds of other cards.

This alone means that the KYRO II should smack down similarly priced cards. Unfortunately it enters a market in which the previous generation of high-end cards are undergoing a dramatic price drop. The Hercules Prophet 4500 finds itself in competition with 32MB GeForce2, rather than the GeForce2 MX, which is priced over $150 lower than the Prophet 4500. In our benchmarks the Prophet 4500 manages to perform to the level of its NVIDIA counterparts in most of our tests, and sits well ahead of the GeForce2 MX. Unfortunately the 32MB GeForce2 GTS just scrapes ahead in the results.

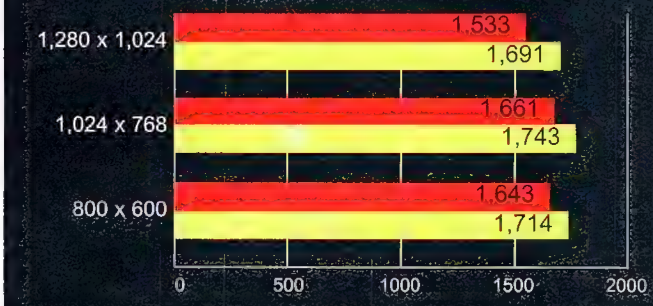
The Prophet 4500 outperforms the previous generation of KYRO by a significant margin. This comes down to the higher clock speeds used in the KYRO II, the architectural changes are quite minor. It also outperforms the higher priced ATI RADEON 64MB DDR cards, however these cards have the advantage of Hardware T&L, as well as the various added technologies like Hyper-Z and Video In/Video Out support.

The Hercules Prophet 4500 is a welcome addition the chipset starved graphics industry. Hopefully the introduction of this card will lead towards companies starting to look outside of NVIDIA for their chips.

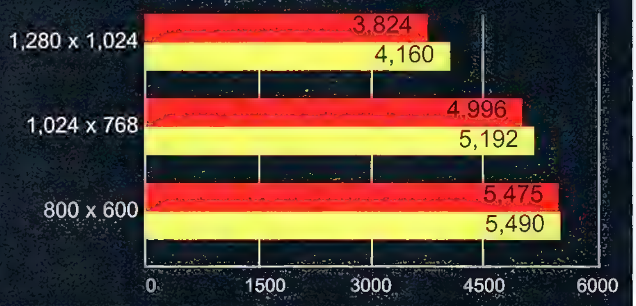
The KYRO II chipset is designed for 32-bit colour, and actually renders everything in 32-bit and then downsamples it to 16-bit. This leads to a minimal difference in performance at the two

TECHNICAL DETAILS

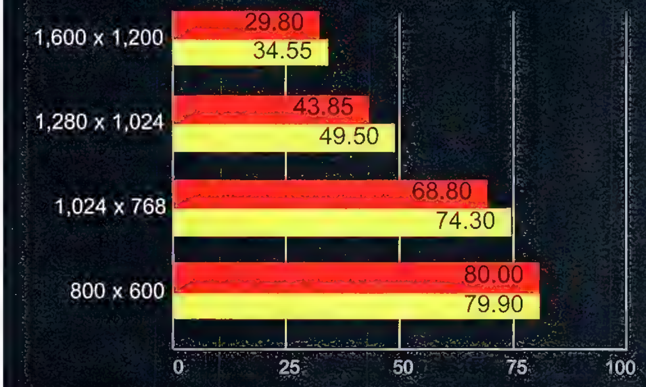
3DMark2001 Pro



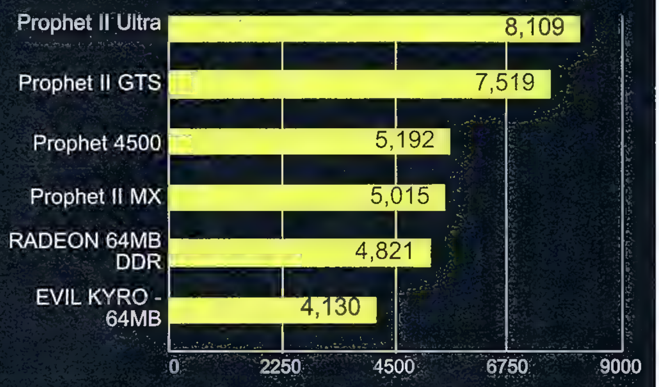
3DMark2000 Pro



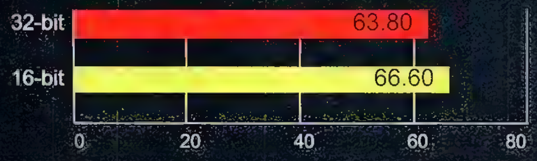
Quake 3: Arena - max settings



3DMark2000 Pro standard test



MBTR - 1,024 x 768



KEY TO ATOMIC GRAPHS

🟨 16-bit colour

🟥 32-bit colour

colour depths. The atomic staff also agree that the image output by the Prophet 4500 looks much richer and colourful than the competing NVIDIA chipsets. This has been a feature of all the STMicroelectronics chipsets, from their PC ventures with the various PowerVR chips through to their console outing with the Sega Dreamcast.

In the end it comes down to the similar series of trade offs that were a feature of video cards in days past. It comes down to working out whether you prefer the rich 32-bit colour of the Prophet 4500 or the similar speed hardware T&L of the GeForce2 GTS. The Prophet 4500 shows that NVIDIA's dominance is assailable in the current marketplace, and if STMicroelectronics can deliver a hardware T&L powered card then NVIDIA should be very scared.

SPECIFICATIONS

64MB 175MHz SDRAM, Internal True Colour, Fast 32-bit colour support, Tile-Based Renderer

Outputs: D-Sub

Web Site: www.hercules.com.au **Price:** $499.00

atomic
8/10

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NOTE

Actual performance of the CRW2100 is dependant on the Application software and recording media used.

CRW2100 is compatible with 16X media, & also compatible with lower specified discs at or above their recommended speed.

CD-RW speeds of 8X and 10X require discs bearing the COMPACT disc ReWritable logo.

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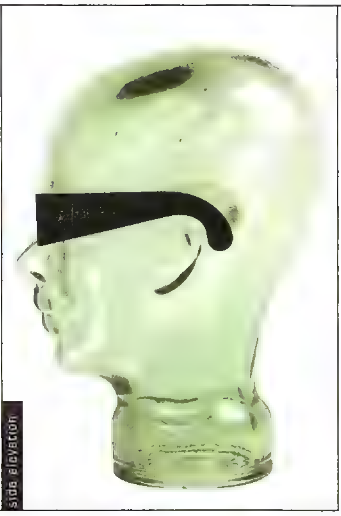


From VR helmets to stereoscopic LCD glasses, 3D solutions for the PC have had a tendency to cause headaches, vomiting and, in extreme cases, eyeballs to burst from their sockets. The latest kit to attempt to scramble your brain waves comes from Wicked3D, in the form of the eyeSCREAM light.

The eyeSCREAM light kit seems flimsy at first, with two pairs of cardboard glasses and one CD. The glasses are the same as the red/blue anaglyph glasses that are used when watching 3D films. In fact, the eyeSCREAM Light kit uses the exact same principle as these movies to create a 3D effect.

The install was quick and painless, with the software automatically searching my PC for any games it was compatible with. There are three different levels of 3D that you can choose from, from 50 per cent for beginners up to 100 per cent for experienced users.

The first thing to strike me about the kit was how pronounced the 3D effect was. I actually had to refocus when shifting my view from the foreground to the background. For the first couple of hours the process of focusing my eyes on an imaginary point beyond the monitor was painful, however, my eyes soon became accustomed to this new method of focusing and the pain disappeared. While the 3D effect was amazing, there is a severe price to pay for using the red/blue technique, with a bizarre overall red/blue colouring that just can't be described until seen.

At only US$15, this has to be the best value for money 3D kit I've seen, surpassing even the more expensive LCD shutter glasses for performance. However, the problem with colouring relegates this kit to the 3D gimmick bin alongside all the other failed attempts at removing the 2D barrier.

SPECIFICATIONS

2 x Red/Blue cardboard glasses , 1 x eyeSCREAM light software CD, compatible with most popular OpenGL software and games

Web site: www.wicked3d.com **Price:** US$15.00

atomic
6.5/10

Hitachi DZ-MV100A DVD Cam

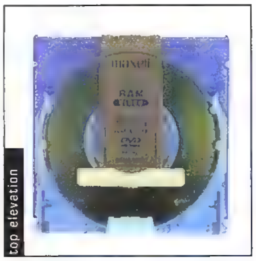
The Hitachi DZ-MV100A DVD Cam is an ordinary looking camcorder with a 77mm DVD-RAM drive for storage. That's right - it writes DVDs.

At the moment, few computer drives and no DVD players understand the read/write Book2.1 DVD-RAM format the camera uses. In the meantime, you can use the DVD Cam's analogue video outputs, or move data to a PC via USB.

The little discs hold 30 minutes of DVD quality video on each side, or 60 minutes if you use the lower quality video mode. The camera can also take 1280 by 960 pixel still photos - and it has a built-in flash.

The DVD Cam has instant access to anything on its disc, and lets you do some basic but undeniably useful in-camera editing. The built in editing system gives you a few transition effects besides plain cuts, and it lets you skip over or actually delete part, or all, of any shot. There's a simple thumbnail interface to access the contents of the disc - really, a must-have feature in any form of digital camera.

Unfortunately, the DVD Cam's image quality isn't as good as even a cheaper Hi8 camcorder, let alone its Mini DV competition around the $4000 mark. The Constant Bit Rate (CBR) video encoder the Hitachi uses is inferior to the Variable Bit Rate (VBR) encoders used to create movie DVDs, and it doesn't deal well with moving detail. If you pan past a tree, for instance, the leaves go crunchy as they move.



No PC editing software supports the Hitachi's MPEG-2 DVD video format, and despite the integrated flash its still images don't look as good as a dedicated digital still camera. The major benefit is the inbuilt editing functions.

SPECIFICATIONS

12X optical zoom, Electronic image stabiliser, 8 lux minimum light rating, 1.3 gigabyte per side disc storage

Outputs: USB, composite video, Y/C video

Web site: www.hitachi.com.au **Price:** $3,999

atomic
7.5/10

Logitech Cordless MouseMan Optical

The Logitech Cordless MouseMan Optical Setup and installation was simple, the receiver unit can plug into both a USB port and PS/2. Driver installation occurred without hitch and guides you through a comprehensive range of configurable options, such as the ability to customise the functions bound to each of the three buttons and the scroll wheel. Among the options is the ability to open up a Windows Explorer window, a drag-lock function and keyboard functions such as Shift, Alt, or Esc. You can customise mouse pointers and adjust the mousing speed and acceleration, even the default mouse orientation can be customised for those who cant help but tweak everything tweakable. A far cry from what was once the humble mouse.

In keeping with the typical Logitech feel, the Cordless MouseMan Optical is chiselled with ergonomic lines, designed with intent to offer maximum comfort, and clad with funky styling. The two main buttons and scroll-wheel are positioned easily under your fingers, and posses a solid feeling action that works very well for gaming. The third button, placed just under the thumb worked reasonably well, although at times the thumb would brush the mousing surface when activating the button. The unit is rather heavy, due to the two AA batteries inside, which suited me just fine, but may not be to everyone's taste.

Apart from the obvious freedom of not having to run a chord from the mouse to the back of you box - presenting a small advantage over its corded brethren if used on a cluttered desk - the convenience offered by a cordless mouse seemed a little on the novel side, considering you are still tied to your keyboard. Add to that the possibility of signal scrambling if the newbie sitting next to you at the Counter-strike LAN is using one on the same channel. Fortunately the channel can be switched with a simple click of the connect button both in the software properties and on the receiver unit. Overall, the Logitech MouseMan Cordless is a solid and eminently playable mouse, if you feel that cordless convenience is worth paying for.

SPECIFICATIONS

Cordless optical mouse, USB or PS/2 receiver connection, 800dpi optical sensor resolution, drivers for Window 3.x/9x/ME/2000 and MacOS 8.6 or higher, 5 year warranty.
Web site: www.logitech.com **Price:** $159.00

atomic
8/10

Hitachi CM813 Plus

It serves little purpose to pack your case full of the good stuff, if your monitor cannot achieve resolutions above 1,024 x 768 at viewable refresh rates, considering the GeForce3 achieves playable frame rates at an astounding resolution of 2,048 x 1,536. Shadowmask monitors at sizes above 19in can often accentuate pixellation, as the dot pitch is spread over a wider screen area. Fortunately for the CM813 Plus, the 0.22mm dot pitch is sufficiently small to maintain a relatively defined image, though not with the same fidelity that a Flat-CRT is capable of. Obviously it is big and you'd be silly not to accommodate that, but features a relatively narrow bezel and understated curved lines to ensure it doesn't look too shabby. The OSD interface consists of no less than 12 buttons offering the full range of geometry controllers, colour purity and moire adjustment, and even a separate button to degauss. Having 12 buttons seemed a little excessive, and definitely not the most intuitive, but this is not a major complaint.

The Hitachi CM813 Plus was put through the rigors of DisplayMate, which uncovered some surprisingly strong qualities. Most notably, screen framing and aspect ratio tests revealed near-perfect circles and squares, where many monitors tend to render oval and rectangular shaped images. Above average results in colour registration and colour uniformity show the Hitachi is quite a capable monitor indeed. Considering that some 19in monitors have up to 230MHz of video bandwidth, 250MHz seems fairly average for a 21in unit. Accordingly, video bandwidth brightness tests reveals a slight deficiency in rendering thin white lines with the same intensity as thick ones against a black background, and visa versa. Similarly, global and local screen regulation tests reveal movement of lines when large colour intensity blocks are flashed on the screen, again indicating average video bandwidth. All together, the CM813 Plus is a great 21in monitor.

SPECIFICATIONS

21in Invar shadowmask tube, 19.9in viewable diagonal, 0.22mm dot pitch, 1,920 x 1,440 at 75Hz, 2 x Non-captive D-Sub and USB connections, OSD, 27.5kg.
Web site: www.hitachi.com.au **Price:** $2,075

atomic
7.5/10

DigiTheatre DTS

atomic HOT

VideoLogic's top gun speaker set make for a happy David Kidd

Last month we reviewed the excellent VideoLogic DigiTheatre PC. The package included everything you need to get digital 5.1 surround sound happening on your desktop. Aside from the superb sound quality most associate with VideoLogic sound systems, the latest speaker set is everything the DigiTheatre PC/LC isn't. The DigiTheatre DTS is a high-end system pitched at those who are serious (in a $1,600 way) about their surround sound and have the hardware to support it.

Although the set is pitched towards PCs, the size, price and inputs suggest home entertainment. The 70 watt sub is huge (350 x 245 x 400mm) while the combined control unit/centre speaker is a little on the large side. Based on the Sirocco Crossfire speakers, the 30 watt satellites contain dual Audax drive units with a 80mm bass/mid cone and a 10mm high frequency tweeter. Speaker wall fasteners are sold separately.

The control panel on the centre speaker is a nice space-saving idea and allows quick access to surround mode, volume and input selections. Available modes include Stereo, Dolby Digital, DTS and Dolby Pro Logic. To complete the control system, a remote control unit is included offering all the functions available on the unit.

The inputs indicate the biggest drawback to an otherwise perfect speaker set. In order to get 4.1-surround sound for gaming, a rear speaker input is necessary. This is unfortunately and somewhat suspiciously lacking, meaning that without a digital output from your sound card, 4-channel positioning is unavailable. But for those with digital capability, coaxial and optical inputs are available.

As the name suggests, the DigiTheatre DTS takes advantage of DTS digital surround sound format. The majority of DVD enthusiasts will be more than familiar with Dolby Digital or AC-3 surround sound because most, if not all, major DVD releases do not support DTS. Only recently have we seen a few (I'm only aware of three) titles to use DTS.

The DigiTheatre DTS is one of the greatest aural experiences I've had. After much searching I managed to track down a copy of the digitally remastered version of *Dune* to test the DTS quality. The stark contrast when switching between AC-3 and DTS was like instantaneously painting the room a different colour. True to the technology, the DTS track was much deeper and clearer. The sound of the 'thumper' calling forth a sand worm was truly amazing, causing everything in the room to rattle. I immediately scrambled through my collection in a vain attempt to find something, anything, even a trial disc but all I could find that supported DTS was *Gladiator* and, although the DTS track offered a noticeably superior sound, the effect was not so obvious.

It may seem that the merits of this speaker set rely heavily on DTS technology but make no mistake; DTS needs a high quality sound system to gain any real benefit over Dolby Digital.

Without spending big dollars there is little chance of finding a more superior sound for games, music or digitally enhanced audio. VideoLogic's commitment to quality is expressed in their decision to utilise the technically superior DTS format and, unlike other speaker sets, it clearly makes AC-3 seem redundant. Unfortunately for gamers, you'll need a digital output on your sound card for basic 4.1 surround and there are more practical and affordable solutions for your PC.

If you're serious about digital 5.1 surround sound you can stop looking.

SPECIFICATIONS

Digital optical/coaxial inputs; Left/Right stereo only inputs; 30 watt satellites + 70 watt sub totalling 220 watt RMS. Supports: Dolby Digital, DTS, Dolby Pro Logic, Stereo

Web site: www.videologic.com **Price:** $1595.00

atomic 9/10

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BRIDGESTONE

NAMING RIGHTS

There has been one major rising trend in games nowadays, especially those with a heavy online component. This is the inclusion of a central register of nicknames, a feature that has reared its head in both Black & White and Tribes 2. The online component of both games requires the player to log in to a central server for authorisation.

Both games then use this login as your primary nickname for online play. Of course this means that only one player in the world can use a particular nickname. This is fine if your nick is a true one off, but for the majority of us our nicknames may be unique within the relatively small Australia/New Zealand gaming community but definitely not unique worldwide.

This goes hand in hand with the increasingly common lag time between overseas and local software releases. In the case of Tribes 2 this was a relatively small two and a half weeks difference, but long enough for a large number of nicknames to be scooped up. Black & White thankfully had the ability to register your nickname on the Web Site before you got the game, but this was still swamped with entries in a short space of time.

Having registered nicknames is a fantastic idea. Anyone who has ever suffered at the hands of an impersonator online will know the huge hassle that you need to go through to clear your name. Sure, having two players with the same nick is annoying, but it is the malicious few that deliberately impersonate that cause the trouble. Tribes 2 takes this protection one step further by tying your nickname into clan membership, as well as colouring primary and secondary nicknames different ingame. This allows name users to be discovered at a glance, and unless some serious password pinching has gone on, anyone with their name showing in white is actually that person, and if their clan tags are in yellow they are actually members of that clan.

The major problem is that online gaming communities tend to be clustered into certain, albeit large, geographical areas. I came across a similar problem when our clan registered for a global CounterStrike clan database. As part of this members had their clan tags 'reserved', meaning that any clans that subsequently joined could not use the same tags. This was fine in principle, because it was annoying when other Australian clans formed and decided to use the same tags, however there was no way that any of our members would play regularly outside Australia or New Zealand. Of course, within days I was emailed the administrators saying that there was a Canadian clan insisting on using the same tags, to which of course the reply was a fairly bemused 'why are you asking me?'.

Analogies can be drawn between this sort of experience and the nickname register in tribes. Sure it can get confusing having to deal with multiple people bearing the same nicknames, but it is also confusing dealing with the many variations used with a name. The common enough experience would be the variation on the name 'Player'. Expect to find variants like –Player-, P|ayer, P|4yer etc. Perhaps the best solution would be to locate each nickname according to the master servers (regional level administration servers), thus facilitating smaller communities than the global scale operation, and allowing us antipodeans an equal chance at getting our favoured nicks.

The next wave of online gaming

Dynamix must be commended for the amount of effort they have devoted into making Tribes 2 more than just an online game. They have managed to make it a completely self-sufficient online community as well, much like the virtual equivalent of a Biosphere. The game features internal clan Web Sites, email, forums, IRC and news. Tribe recruiting can be undertaken from with the game, and for once the internal server browser actually comes close to the stalwart third party browsers like GameSpy and Server Query.

This internal world that is created by Tribes 2 does create a weird little microcosm. You really have little need to leave the game to communicate with others, and apart from the occasional uh-oh from ICQ there is little to leave the game for, apart from sleeping, eating and occasional trips to the bathroom.

It is refreshing to see that developers are acknowledging the community aspect of their games and providing the services to cater for it. As the Tribes 2 community continues to grow it will be very interesting to see how these features fare.

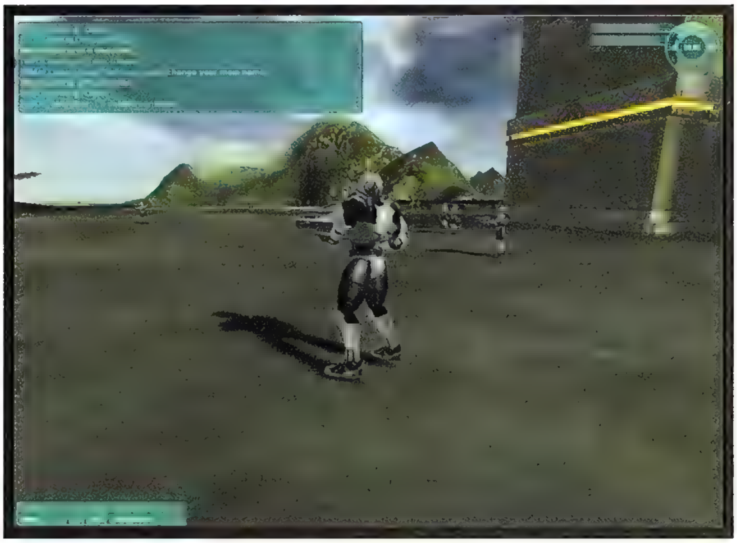
The flipside is how much this approach will permeate itself into future online game releases such as Team Fortress 2, which should use a lot of the same back end services due to it and Tribes 2 both falling under the Sierra umbrella. Previous attempts, such as the mod browser and server tools in Half-Life, have quickly been superseded by much more user-friendly tools such as GameSpy. The Tribes 2 features are light years ahead of these early services, so it certainly bodes well for the future of multiplayer gaming.

John Gillooly

Tribes 2

David the Kidd lives out his *Lord of the Flies* fantasy, with Laser Rifles

When Tribes was released in 1998 something different happened. Unlike the release of Quake or Unreal, Tribes sent a ripple that permeated through the gaming community, meeting high praise and poor sales. It's hard to say what Tribes brought to the world that was actually new. Squad based shooting, classes, and multiplayer gaming wasn't new and the Earthsiege/Starsiege setting was just another speculative fantasy world. Still, Tribes is often referred to as the title that began the multiplayer trend. Why then, did Tribes have such little support?



All your base are belong to shiny silver guys

Possibly the depth in strategy and gameplay was too overwhelming for an arguably undeveloped multiplayer crowd, leading to a hardcore following that fortunately kept the name alive. So now, almost three years after the initial release of Tribes, are we ready for a sequel? Sierra seem to think we are and have changed the game so little that most, I'm sure, won't know the difference.

Tribes 2 has a storyline somewhere but it's not important. Set in the 40th Century, most people can't imagine where humanity will be so bands of warring tribes roaming the galaxy is sort of plausible. With pure tactical multiplayer-only action, a good plot just gets in the way. Each game is played out on a predominantly outdoor map with two teams capturing, holding, besieging and defending key objectives. Traversing the landscape is made easier with a variety of land and air based vehicles ranging from bombers to grav-cycles. Lone soldiers can use their limited jet packs to flit around but keep in mind it can take up to five minutes to move through the map without a vehicle.

Like in real life, after you die you respawn at home. Here, you need to kit yourself out again through the use of various inventory stations around the base. The original Tribes required all team members to wait in line while someone used the station, often for long periods of time, resulting in the slow and naive being shot by the impatient and angry. Tribes 2 fortunately handles things differently where you can select your items, armor and weapons before you step up to the station. Some might say that the inventory station has become redundant but, when the enemy targets your power generator and the inventory station, along with turrets, force fields and sensors goes offline, you'll all be left with only default weapons and little else. Critical base structures are then an important objective in any map and need to be defended and maintained to keep the team fighting at an optimum level. This highlights the depth of the Tribes series, where the team must strike a balance between base defense, offense and objectives.

Mega Mod Madness

Strike Force:

The popular Unreal Tournament mod has begun the move to the Tribes 2 engine. Essentially a Counterstrike-type of mod, Strike Force features real weapons, and locations with a variety of gameplay options. Due to its initial success as a UT conversion, we'll be paying close attention to this.

www.strikeforcecenter.com

Millennium 41:

With the obvious similarity between Tribes and Warhammer 40k, it seems natural that a Warhammer 40k mod would be underway. With an RPG based skills system and psychic powers, M41 should be different enough to warrant a closer look. Still in its initial stages of development so don't expect anything too soon.

www.planettribes.com/m41/

Tribes 2 Army:

Like Strike Force, T2 Army takes advantage of the desire for people to run around in more plausible battle scenarios. Alongside real-world weapons, T2 Army offers modern day fighter planes, attack choppers, tanks and artillery to an increasingly crowded genre. The jet pack will be replace by a grappling hook for scaling buildings and ridges and a parachute will be available for our skydiving needs.

www.planettribes.com/t2army/

Toothless Stumpjumpin Roadkill Rally:

Keeping with the trend of real world situations, TSRR sees the player as a member of the Hatfield or McCoy families in a tongue-in-cheek, white trash war full of sawn-off shotguns, utes, dogs and bear traps. Although the majority of gameplay will involve driving around blasting your opponent, an interesting variant called Shotgun Wedding sees you taking a bride from the enemy family and racing to a chapel to get hitched before the enemy finds out. Check out the Web site for a good laugh...

www.planettribes.com/tsrr/

The different roles in Tribes are more or less determined by your choice of weapons, armour and imagination. A flag runner for example will choose light armour, maybe a shield pack, some flashbangs and then jump in a grav-cycle but for base defense this kit would be unsuitable giving way for heavy armour, a mortar gun and a repair pack.

It's hard to imagine any real change in gameplay for Tribes fans except the use of vehicles. The absence of ground-based vehicles came as a disappointment in the original Tribes but not so in the sequel with the inclusion of tanks, cycles and a mobile base. A bomber has been added to the list of flying vehicles, which like everything in Tribes, requires co-ordinated teamwork to have any real effect. Using vehicles has become a more challenging affair with piloting being much more of a crucial role in itself. Much of the gameplay will be nothing new to Tribes veterans but these additional vehicle changes alone are enough to inject new life into what is essentially a three-year-old game.

Probably the most obvious enhancement to Tribes 2 comes in the graphical overhaul. The original Tribes felt somewhat basic in design but due to the large outdoor fighting arenas we could forgive the crude models and square rooms. Vehicles look more like war machines rather than flying pyramids, and while the indoor areas are still on the square side, they are much easier to navigate with the use of funky, glimmering 'slides'. Weapon and explosion effects are now on par with any current 3D shooter or RTS although player models tend to be on the simple side. It's not until you're standing on a bridge, in the midst of a raging battle with the sky filled with vapour trails from scouts and bombers flying overhead, and a single sniper beam fired from a distant rifle drops you in an instant, do you fully appreciate the game's graphical detail.

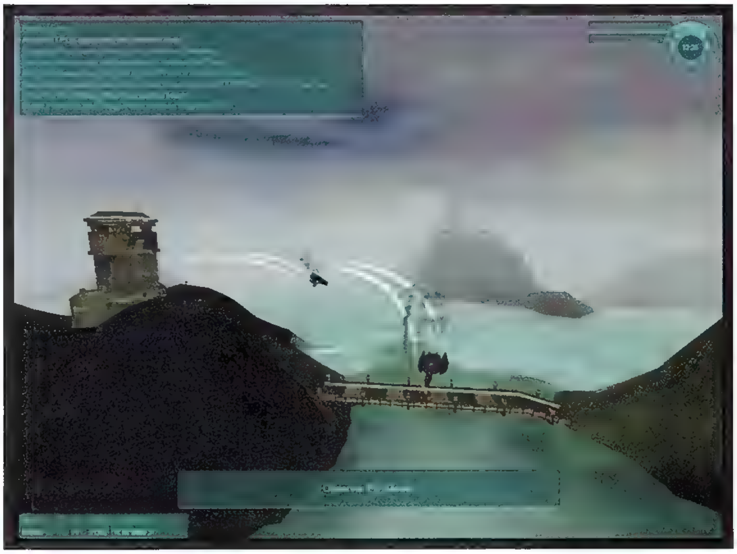
Most of us will tend to overlook a shitty setup interface if the game can compensate- look at Quake 3 Arena. As such, we tend not to mention the interface but with Tribes 2 special mention is definitely in order. Sierra have realized that the lifespan of their latest game will rely heavily on the community that forms around it and have provided in-game access to server lists, forums, news and IRC chat rooms. Combine all this with an auto-patching feature that actually works and you have little reason to use external applications. With all these features, it may sound like a lot of windows to navigate around and thankfully, Tribes 2 has a quick navigation bar to avoid the confusion inherent in online interfaces.

Although Tribes 2 comes with a single player 'campaign', this is essentially a string of related tutorials. Tribes 2 is a multiplayer only game, and even still you'll want at least 10 players on each side to have a decent game. The bot skirmishes can't substitute for human opponents and as such, should really be used to fill in extra slots. Local support for Tribes 2 is abundant with an Australian Master Server and many more are just around the corner.

Even with a large amount of players, the probability of jumping on a random server and having a good game is pretty small. Outside of clan matches the amount of co-ordinated tactics and teamwork tends to fall by the wayside and as such, newbies can feel overwhelmed, intimidated and lost. Combine this with a steep learning curve and like its predecessor, Tribes 2 will quickly garner a hardcore cult following. But like any good game, people don't tend to play it. It won't be long until mods start invading the servers and with a focus on sprawling outdoor warfare hopefully we won't just have another Counterstrike.

At least three patches will be required before you'll be able to play online. The numerous bugs have been addressed with a total of six patches since the initial release. Sierra were painfully slow in releasing a basic OpenGL patch for the original Tribes so it's good to see them on top of things this time with updates.

Suffice to say, everything we loved about the original is still here. Even with all the streamlined interfaces and graphical enhancements, new players may still feel swamped with the complexity but the effort put in will be rewarded with what is one of the best multiplayer, squad based action titles out there.



ⓘ Duels to the death in the skies make for great viewing

GAME DETAILS

FOR: The good things about Tribes are still here, the bad things aren't.

AGAINST: Overwhelming at first; Broadband recommended; Bugs.

MINIMUM REQUIREMENTS: Pentium 2/AMD 400MHZ, 128MB RAM, TNT2, 56K Modem, 531MB HDD
RECOMMENDED: Pentium III/ AMD 800MHZ, 192MB RAM, GeForce2, ADSL/Cable Modem
SOUND APIs: Direct Sound, EAX
VIDEO APIs: OpenGL, Direct 3D

DEVELOPER: Dynamix www.dynamix.com
PUBLISHER: Sierra www.tribes2.com
DISTRIBUTOR: Jack of All Games www.jackofallgames.com.au

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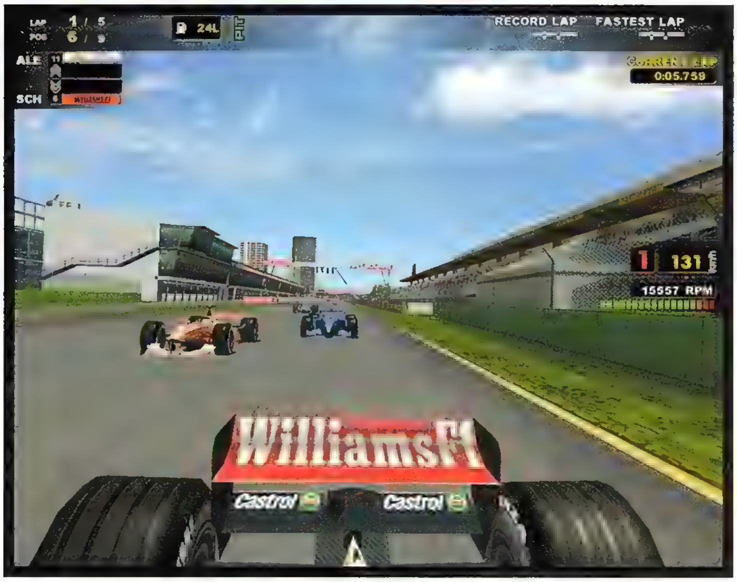
atomic
9/10

F1 Racing Championship

George Soropos yearns for the good old days of F1 underskirts



ⓘ Those pedestrian walkways have saved thousands of lives over the years

The French rivalry with the English has been an ongoing thing for centuries, ever since the Normans invaded the British Isles and started complaining about the weather. So when the English team behind Microprose's Grand Prix 3 established their work as the king of all Formula 1 games last year it was only a matter of time before the French tried to return them to their place as the Mexicans of Europe.

Unfortunately, and typically, they've approached the task from the wrong direction. What genuine racing gamers appreciate the most is 'road feel', handling, or some call it 'physics', so the developer's decisions to focus more on the game's cosmetic aspects is hard to understand.

F1 Racing Championship is indeed an attractive game. Never before have the world's F1 venues been so faithfully and accurately rendered, with every apartment complex, office tower and hot dog stand reproduced down to the tiniest mustard stain. Of course when you're driving a twitchy F1 car at 260 kp/h none of this matters, which is a problem.

The real issue is that your car simply doesn't feel as though it's attached to the road. As an example, if you want a laugh just play a demo of the game and watch what happens when you turn anywhere sharply, the 4th or 5th corners at Monaco are a good test. The front of your car seems to float sideways like some sort of hover craft. It becomes painfully obvious that real friction physics are not at work here, just the Marcel Marceau variety.

When it comes time to look under the bonnet you'll find that the developers have included a plethora of car tuning options, including a few not found in GP3 such as a diff. Lock factor, parallelism and camber adjustments. But the simple truth is that, when the game physics aren't up to scratch, no amount of adjustments are going to make up for it.

Another problem with F1RC arises in single player mode when you try to race against computer controlled competitors. The antics of these people make the old feud between Damon Hill and Schumacher, M look tame by comparison. To make things worse they all seem to be feuding with you! To finish a race the player basically has to be very careful passing anyone on the inside of a corner as they usually just turn in and take you out. In short the AI is terrible and makes F1 RC only really enjoyable if it's played on a network.

Sadly there are still more areas where F1 RC doesn't match up with GP3. One glaring oddity is the in-car cockpit view. Odd because so much work has gone into the visual aspects of the game in every area except one. The cockpit view is horrible, compared to GP3 it's unforgivable. It looks like a hangover from the PS 2 and DC versions of the game and should have never been used. By the way the console versions of F1 RC are completely different games and this review does not refer to them at all.

Of course there is one more area where F1 RC gets left behind GP3 and that is in the long-term development of the game. There are now many mods available for GP3, you can update your version to include the 2001 season teams, cars and drivers and add new tracks that aren't a part of the regular season, Bathurst is one notable example. GP3's devoted fan base ensures that this kind of development will continue but it is hard to see anything like that happening for Ubi Soft's new title.

This makes F1 Racing Championship sound like a terrible game, it isn't. It's the second best GP sim around but in this business being second to an older product is the same as being nowhere.

GAME DETAILS

FOR: Beautifully rendered circuits, Extensive car tuning options.

AGAINST: Doesn't have the on road 'feel' of GP3 due to less accurate physics.

MINIMUM REQUIREMENTS: PII 300, 8MB video, 6x CD, 64MB RAM
RECOMMENDED: PIII /AMD 1 GHz +, 32MB video, 128 MB RAM
SOUND APIs: Direct Sound, EAX
VIDEO APIs: OpenGL, Direct 3D

DEVELOPER: Video Systems www.dreamsquare.co.jp
PUBLISHER: Ubi Soft www.ubisoft.com
DISTRIBUTOR: Ubi Soft www.ubisoft.com

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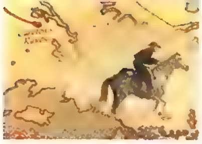


Desperados: Wanted Dead or Alive

Des McNicholas is desperately looking for new game fun and may have found it

Just when you thought you'd hung up your shoot'n irons for good, Infogrammes moseys on out with Desperados: Wanted Dead or Alive. Although a huge draw card at the cinema, the Wild West has rarely been the subject of computer games, despite offering a (largely fictional) history of glamour, adventure, heroes, villains and gunfights. Desperados might just change that, with a mix of challenging missions, first rate cut scenes, and a cheesy plot that the great Duke himself would have been proud of.

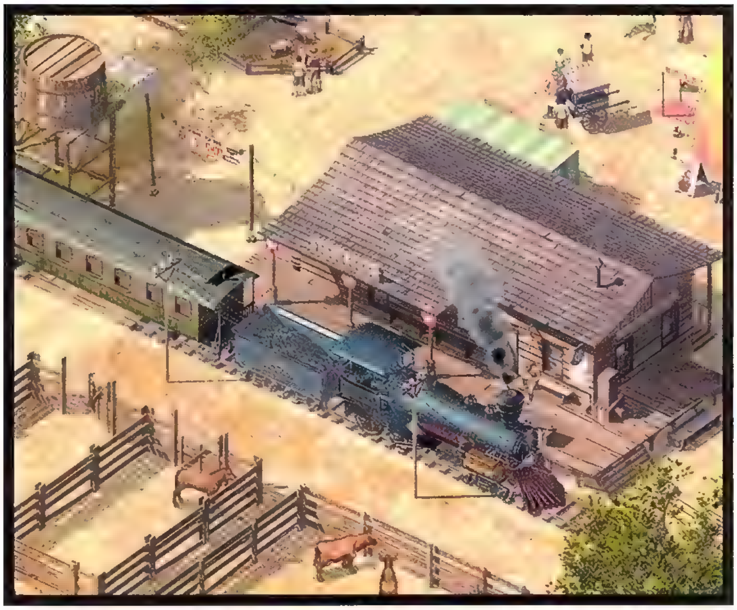
Desperados puts you in the role of bounty hunter John Cooper, hot on the trail of train robber El Diablo - a vicious killer with a penchant for filling everyone full of lead. The local railroad is willing to pay plenty for the chance to string El Diablo up, so you set off to get the old gang together to bring him in. Anyone who has ever seen a western - any western - should be getting the idea by now! Spanning 25 missions, the first few of which double as tutorials and team-gatherers, Desperados follows an unashamedly cliché d plot throughout, adding to the period feel with music, language and regular cut scenes.

Desperados is a top-down RTS, full of gun-toting hombres and complex tactical problems. Cooper's gang members all come with particular talents, such as sharp-shooting, explosives, rope work or first aid, and charging down Main Street for a shootout is a sure-fire recipe for disaster. The trick is to use the right character for the right job, tackling each mission piece by piece. Players need to fight or sneak their way past roving guards, kill, kidnap, steal, or destroy, and then get out again. It's impossible not to draw comparisons with Commandos here, because the game mechanics are essentially the same, although the missions themselves have a distinctly 'Western' flavour, and the deserts of Arizona offer some unique challenges.

Controlling things is pretty straightforward in Desperados, particularly once you've mastered recording and executing quick action shortcuts. These handy little tools allow you to plan an action, such as throwing a punch, and then employ it whenever you're ready at the stroke of a key. Gang members are selected by mouse or number key, as are weapons, special equipment, and game objects. Just to be on the safe side, the mouse pointer changes appearance whenever an action is possible, and on screen icons are available for those with poor memories. Missions are exceptionally well briefed (although the American drawl makes them unbearably slow) and there's always more than one way to skin the cat.

Infogrammes have done an excellent job of creating challenging and diverse environments for each mission, through the use of complex terrain, reasonably smart AI for the opposition, and plenty of innocent bystander action. The towns and countryside look terrific (if a little disappointing when zoomed in), offering a host of approach and cover opportunities for that cunning plan. Visibility is managed particularly well, with cotton fields providing the chance to sneak up for some deft knife work, while field of view cones allow you to pick your moment to make a dash across open ground.

Desperados is a remarkably challenging game supported by an engaging storyline and a simple interface. If nothing else, it provides a neat twist to the RTS genre, tapping into a largely ignored period in history. Whilst most of it has been done before, it's fair to say that it hasn't usually been done this well. Commandos with Cowboys it may be, but Infogrammes has injected just enough originality into Desperados to let it stand alone.



The last train into Dodge - all aboard for some gunslinging action

GAME DETAILS

FOR: Challenging missions, great period feel, and you get to ride a horse.

AGAINST: Nothing really new in the game mechanics, tends to be a little plodding, and I can't stop talking in Western.

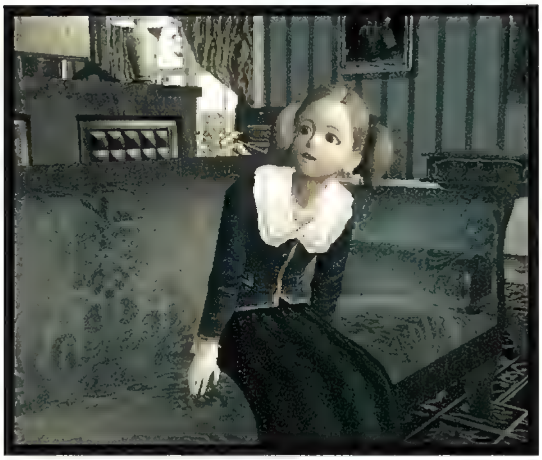
MINIMUM REQUIREMENTS: P233, 64MB RAM, HDD min 300MB, no 3D card required
RECOMMENDED: PIII 450, HDD 520MB
SOUND APIs: Direct Sound
VIDEO APIs: Direct 3D

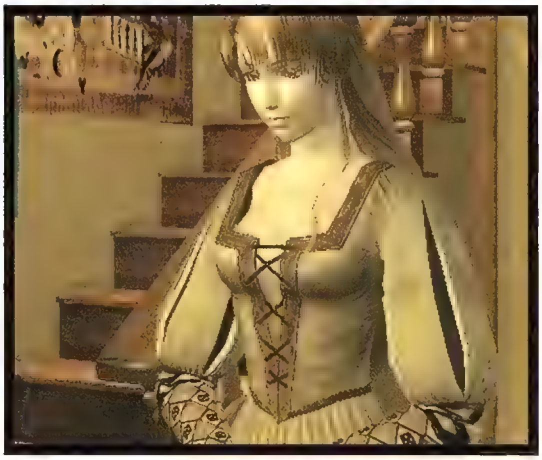
DEVELOPER: Spellbound www.spellbound.de
PUBLISHER: Infogrammes www.infogrammes.com
DISTRIBUTOR: Ozisoft www.ozisoft.com

atomic
8/10

Shadow of Memories

Time traveller, Des McNicholas, gets adventurous with a PS2





Konami cleverly and subtly alter the graphical appearance of Shadows of Memories to reflect the time period

In Shadow of Memories, developer Konami has added a new twist to the console adventure genre. By combining an intriguing murder mystery with the endless possibilities of time travel, they have created a world where cause and effect have a bearing on every decision players make. The result is a unique experience that seems less linear than most adventure games, and one in which the various sub plots are important. Add terrific visuals, better than average voice acting, and a high quality sound track, and Shadow of Memories is a solid addition to the slowly growing pool of quality PS2 titles.

Shadow of Memories puts you in the role of Eike, a "mild mannered youth with just a hint of darkness to him," who unfortunately gets stabbed to death in the first scene. After meeting up with the mysterious Homunculus on the way to the afterlife, you're given a time machine and the opportunity to change your fate. Naturally, travelling through time can have unintended consequences, most of which just result in death coming in another way. The pieces gradually fall into place, despite a plot that gets more complex as you work through it, with past actions having a major effect on whether you stay alive in the present. Clues are everywhere, but you won't always recognise them until you've meddled with time.

Saving Eike takes players across four time zones and nine different levels. The action is centred on a single town, as it advances from the middle ages, through the 1900s and the 80s to the present day. Period feel is achieved by subtle changes in the town's layout, and by shading techniques. The 1500s, for example, are reflected in sepia tones, whilst the turn of the century world is in stark black and white. It all looks stunning, particularly when the high quality weather and lighting effects are taken into account, although the atmosphere is let down a little by the general lack of population. There are some very nice touches, such as the changing sound of footsteps as they move from dirt to cobblestones, and the slower rate of movement in snow.

Controlling Eike is straightforward, although Konami's third person perspective takes a little bit of getting used too. The viewpoint generally adjusts automatically to the direction you're facing, and mastering the view buttons allows you to explore the entire game environment. Selecting items is just a matter of scrolling through the icons, and a short cut is provided for the all-important map. Just to keep the pressure up, a clock keeps you up to date with how long you have left to live in your own timeline, with a countdown taking over once things get tight.

Shadow of Memories' greatest strength, and its greatest weakness, lies in the use of high quality but overplayed cut scenes. They just seem to go on forever, creating a feeling of observation rather than participation for the player. There's no doubt a fantastic movie opportunity in there somewhere, but Konami promised us a game this time around. An adventure title will clearly have less action than an RPG, but the lack of interactioncan be frustrating at times. That said, the replay value is good, given the wide range of choices open to reach one of five different endings. Shadow of Memories is a solid title - with more action, it could have been a great one.

atomic

7.5/10

GAME DETAILS

○ **FOR:** Great plot, looks terrific, and brains are actually required.

○ **AGAINST:** Cut scenes are too long, and the streets often seem empty.

MINIMUM REQUIREMENTS: PS2, Memory Card
RECOMMENDED: Dual Shock

DEVELOPER: Konami www.konami.com
PUBLISHER: Konami www.konami.com
DISTRIBUTOR: Ozisoft www.ozisoft.com.au

MTV Music Generator 2

Yo yo, DJ George Soropos is on the mike and is down wid da jiggy rhymin' toons and pumpin' basslinez. Well, that's what he thinks...

Back in the 70s getting into DIY music meant cutting the knees out of your jeans, putting some Tarzan's Grip in your hair and calling yourself Johnny Vomit. The harnessing of computer technology has changed that rough and ready approach to the point where a lot of commercially produced music is now done in 'bedroom studios' in people's homes.

MTV Music generator is designed as the ultimate DIY music box for people with an urge to create tunes but who don't have the training, cash or commitment to start setting up their own studio. Not everyone with an ability to write music realises it until past the point when they think they should have anyway. Our early musical experiences usually revolved around dull teachers telling us about dead Austrians, and trying not to laugh whenever they talked about the importance of fingering.

The first version of Music Generator was popular with closet producers and DJs of all sorts, even with the enormous limitations of working on a machine with only 2.4MB of RAM. It was impossible to make any long tracks or use too many effects at once but it gave users a good idea what could be done with the revolutionary technology that has changed music production so much over the last ten years.

The massively increased RAM of the PS2, along with a much faster DVD drive and the 8MB memory card has meant a massive boost to the capabilities of MTV Music Generator 2. There are now over 9000 sounds to play with and the PS2's memory card can hold 99 tracks which would make it possible for you to perform non-stop at your own telethon or Trans-Pacific Zeppelin expedition.

The compositional interface has been completely redesigned with tracks now scrolling vertically, like many .mod file players of old, and a very handy sound palette to the left of screen which stores all the sounds and loops you have used already for easy access when you want to use them again. Adding sounds from the massive bank of techno, rock, R&B, garage and trance basslines, beats and melodies to your tune are as easy as you could hope for.

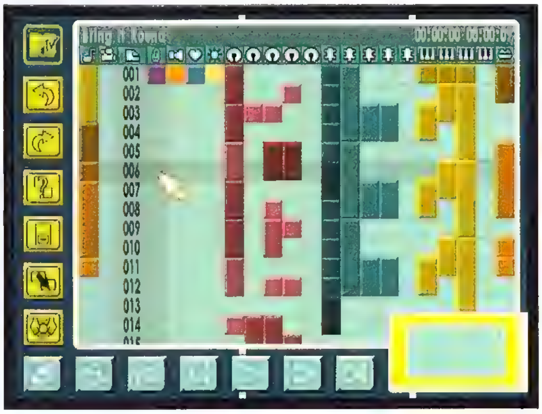
A song is broken up into separate columns for each part. Basslines, beats and melodies are obviously the main ingredient but you can also add effects, panning, volume control and video in their own columns too. When you add a new riff the program creates a new column automatically so you can just keep fattening up your track until the PS2 runs out of steam.

Jester have recruited some high profile help in designing the sounds included with MG2. The first incarnation of Music Generator was focused more around rock and hip-hop, ignoring this style of composition's true home, techno. This time some well known producers of all kinds of dance music have been rounded up for the job: Apollo 440, Roni Size, Bentley Rhythm Ace, Funkmaster Flex (yes, don't laugh, that's a real name) and Cassandra Fox.

If you don't fancy any of those however you can find your own, MTV MG2 is one of the only pieces of software for the PS2 that comes with peripherals. An external sampler and microphone kit will be available, either bundled with the software or bought separately, depending on where you buy it from. The sounds you sample will save to your memory card and be accesible as easily and simply as those on the CD.

The only really disappointing thing about MTV MG2 is the video component. It was a gimmick in the first version of the program and nothing has changed much. You can do a bit more with the images but in the end it's just a bunch of squiggly fractals bobbing around, interesting for a short while only.

MTV Music Generator 2 provides all the tools you need to experiment with making your own music at a fraction of the cost of even a low grade sampler and sequencing package. If you feel that a star is waiting to be born in your very own living room or just want to muck about, MG2 is a wise investment.



This isn't some falling shapes game, it's a music maker!

GAME DETAILS

FOR: More memory and power in the PS2 means more of everything, make songs bigger, richer and with more variation.

AGAINST: Gamepad interface can be tedious to use over long periods, video is still just a tacky gimmick and will be quickly ignored by most users.

DEVELOPER: Jetster Interactive www.jesterinteractive.co.uk
PUBLISHER: Codemasters www.codemasters.com
DISTRIBUTOR: Infrogrammes www.infrogrammes.com

atomic
8/10

Quake 3 Revolution

John Gillooly grabs a control pad and camps near his television

The Quake series of games is the closest thing to PC gaming Nirvana. This transfers over to people viewing console ports of Quake games as sacrilege and Quake 3 for the PS2 has the potential to be an appalling mess, as the vast majority of these First Person Shooter ports are. However over time console developers have been improving on their attempts, something that has so far been best demonstrated by TimeSplitters on the PS2.

Quake 3 Revolution, as the PS2 port is called, has been developed in conjunction with id Software and Bullfrog, a company with a fine heritage of new and innovative PC games, but with little First Person Shooter experience. This is at first off-putting, until you realise the litany of classics that Bullfrog have produced in many disparate genres.

There are some instant turnoffs for the hardcore deathmatcher though. Unlike the Dreamcast version of Q3, the PS2 version does not have keyboard and mouse support. Similarly the lack of online capability on the PS2 means that multiplayer is limited to split screen for up to four players.

Quake 3 for the PS2 is a much more enjoyable shooter experience than TimeSplitters, not only because you are able to jump, but also because the Quake philosophy is very much based upon frenetic action. The nature of the controls for the game mean that the gameplay experience is much different to the PC twitch-fest. The major loser is the vertical game, purely because it becomes difficult to get the precision needed to rail some newbie mid air.

Control Freaks

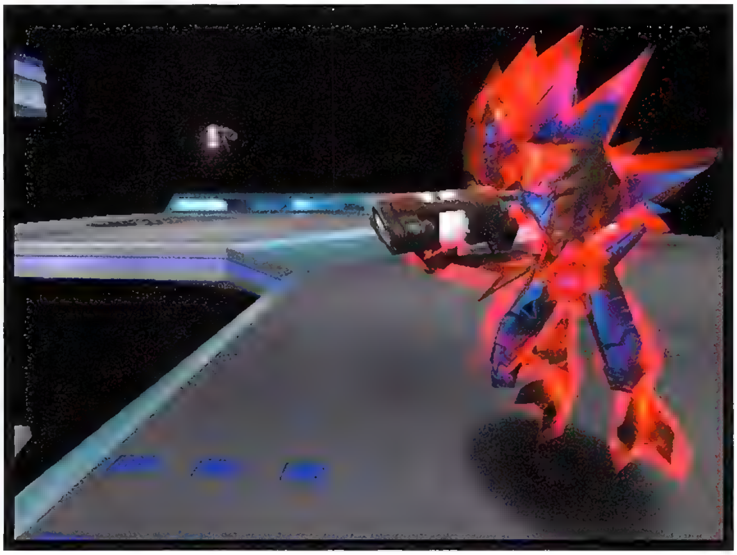
The standard controls suck so badly that words cannot fully describe the painful experience that they create. However the 'advanced' controls are much more intuitive and easy to learn. Basically this shifts the shoot and jump buttons away from the main control pad and maps them to the left and right shoulder buttons. This allows you to move, jump and shoot at once, which will have you rocket jumping and circle strafing in no time whatsoever.

The single player game diverts somewhat from the PC version, incorporating a variety of missions above and beyond the 'top the frags' objectives of the PC version. This includes a variant of the popular 'tag' or 'king of the hill' game modes as well as Capture the Flag and Elimination modes.

In multiplayer these modes are also available. Of particular note is the 'single weapon' gamestyles, which emulate the very popular Rocket Arena mod for the PC version. The major inconvenience with multiplayer is the ever present need for a multitap for four player games, and the use of split screen, which can get quite confusing at times, especially on small television screens.

Professional PC Quake 3 players will be somewhat disappointed with the graphics, for the game lacks the "turnoff all textures and detail so it looks like Quake 2" option that makes professional gaming so exciting. In its high detail glory, the game looks fantastic and runs with no noticeable slowdown. The game can get very dark, but apart from that, this really is a graphical treat. The PC version has always had a poor menu system so Kudos must go to Bullfrog for polishing up the menu interface, it is filled with lots of nice cosmetic touches, and finally makes Quake 3 look like a complete package.

As far as console shooters go, Quake 3 Revolution rockets itself up into the upper levels, diverting from the majority of sneaker based shooters, and sticking closer to the console experience of providing a quick fun blast for one or more players. Seeing as this is their first foray into this field, Bullfrog should be commended for making such a well-rounded port of perhaps the most venerable PC game. Perhaps we can finally forgive them for High Octane. ▢



ⓘ The graphics in Quake 3 Revolution are quick, crisp and very good looking indeed

GAME DETAILS

▢ **FOR:** Fast, frenetic, easy to use controls available, graphically stunning.

▢ **AGAINST:** Split screen multiplayer, No keyboard/mouse support.

MINIMUM REQUIREMENTS: PS2, Dual Shock
RECOMMENDED: Memory Card, four Dual Shock controllers, Multitap

DEVELOPER: Bullfrog www.bullfrog.co.uk
PUBLISHER: Electronic Arts www.ea.com
DISTRIBUTOR: Electronic Arts www.ea.com

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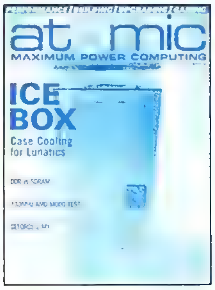
Win a PlayStation 2, Formula 1 2001 + Speedster Wheel

This month one incredibly fortunate subscriber or renewer will win a PlayStation 2! Who wouldn't want a PS/2? That's right, farm animals. So, unless you're a farm animal we think you'd be pretty excited by the possibility of picking up a free PS/2.

It doesn't end with the magic black box, though, because Sony Computer Entertainment, being generous, lovely, people, have also chucked in their brand new F1 game – Formula 1 2001! This is the most sophisticated F1 sim ever created for a console. Sony developed it, so you already know it's spankingly good.

Amongst a bucketload of quality good bits are the inclusion of Murray Walker and Martin Brundle, who will tell you how amazing you are as you lap the losers, plus with over 30 AI parameters, your opponents will race hard and smart. Newbies can customise the game to suit their skill level, eventually playing the game as a full sim when they figure it all out.

Also packed into the prize-pack is the Speedster Wheel, which is really the only way to pilot the man-missile that is an F1 car around the track if you want any semblance of realism in your racing Car Driver hero fantasy..



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PlayStation 2

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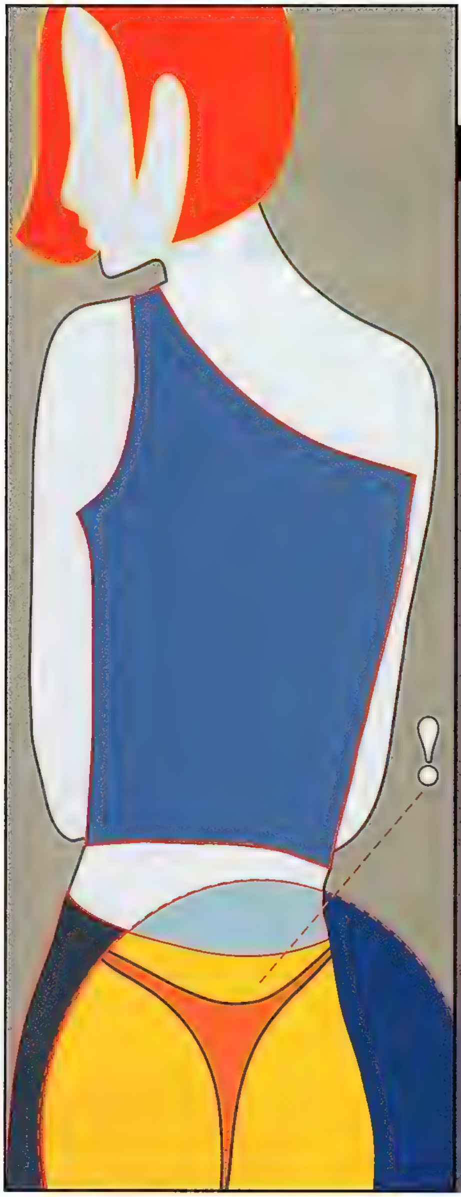
Ctrl+Alt+what? Need help?

Dan Rutter is the man with the solution to your tech-grief. The month's best letter wins an atomic toolkit. Wow!



Letter of the Month: Techno-perv

i Is there really a camcorder that can see through clothes? Where can you buy one?

Gird Thomas

O Sigh. Some image-sensing technologies are sensitive to near infrared (IR) light. The charge-coupled devices (CCDs) used in most digital cameras and camcorders, for instance, all are. Most digital cameras and camcorders will see the IR light emitting diode (LED) of a remote control as a bright white dot.

Anything that's illuminated with near infrared will therefore be visible to a CCD. And if there's no visible light illumination, it won't be visible to the naked eye.

Many better camcorders and digital still cameras have IR filters installed, to stop IR detection from happening, so you don't get exposure problems. It's the same reason you put UV filters on plain film cameras; the non-visible light otherwise hazes the picture. Ordinary film is UV sensitive, not IR sensitive - for IR sensitivity you have to buy special film.

Sony, famously, made a camcorder (the TRV99) with a switchable IR filter, and an IR illuminator. It let you see in the dark. It also let you switch out the IR-blocking filter in the day time. If you then put a filter over the lens that passed nothing but IR, you could see an odd black and white view of nothing but the near-IR kindly provided for you by the world's best IR illuminator, the sun. Current "Super Nightshot" Sony only let you use IR vision in their low-light modes.

And yes, some textiles are fairly transparent to near IR, and so pervs could use that camcorder to see through clothes. After a fashion.

Ever since the Sony camera hit the market - and was then withdrawn, because of unfortunate publicity - every dirty-raincoat dimwit has been bothering camera store staff for IR filters for other cameras, which let through IR and block pretty much everything else. They're under the impression that this is the for-real version of the X-Ray Specs advertised on the back of comic books.

The store staff sell 'em the filters, all right, because they know that J. Random Pervert isn't going to come back and ask for a refund 'cos he couldn't see all them Catholic schoolgirls in the nuddy like he wanted to.

IR filters do, indeed, let you get rid of visible light pollution when you actually want to see nothing but IR. But they're specialised gizmos, and practically useless for ordinary subjects. Not least because almost all clothing is thoroughly opaque to near IR.

It's ever so much cheaper to just imagine people naked.

The White Box Mystery

What does it mean when people are selling "OEM" software and hardware? What is "OEM"?

Richard Liu

OEM stands for Original Equipment Manufacturer. In computer-gear parlance, an "OEM version" is a product that's meant to be sold to system assemblers, and which comes in a white box (if it has a box at all!), and has no fancy software bundle.

An OEM CPU, for instance, is one that comes in a tray with lots of other CPUs, and nothing else included at all. The retailer adds anything you get if you buy it retail, right down to the anti-static bag.

An OEM sound or video card may come in a plain box, or may just come in an anti-static bag. OEM cards usually have a driver CD with them, but that's pretty much it.

Occasionally, OEM versions of graphics cards are lower-spec than the retail version (less memory, lower clock speed, or both), but often they're the same thing, with less packaging.

Some OEM gear is sold under contractual agreements that say it's not to be sold on except to someone assembling a computer. That's the deal with those OEM white-box copies of Windows which you're only meant to be able to buy along with a CPU and motherboard and hard drive.

Most OEM gear, particularly hardware, is just the totally-no-frills version of the product, though, and it's perfectly legit for people to sell it retail. OEM parts can be a very good deal.

Faster! Faster, damn you, faster!

I have an unlocked Duron 650 and an Asus A7V motherboard, 128MB PC133 Apacer RAM and a Thermoengine cooler. Every time I overclock it on the multiplier to 750MHz I get heaps of registry errors on Windows ME and 2000, or my computer just crashes while loading.

I've installed Windows again, but the same thing still happens. I've tried upping the Vcore as suggested, but still no good.

I've heard people are getting this CPU to around 850-900MHz stable. I would like to achieve something around 800-850 without buying new stuff.

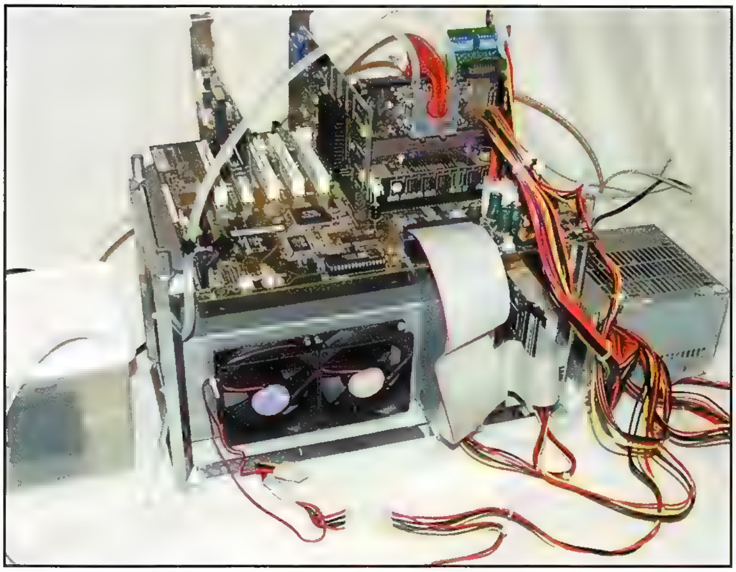
Edwin HYD Cheng

How far you can overclock a given processor depends mainly on that one CPU's core capabilities. The motherboard and RAM and other components can come into it, especially when you're playing around with Front Side Bus overclocking, but it's mainly down to the CPU.

We get lots of these sorts of letters, from people who are irked that their processor isn't as overclock-friendly as various other CPUs they've heard of, about which dead Vikings in Valhalla, or possibly even dead Klingons in Stovokor, can reasonably be expected to sing songs.

Essentially, you have to remember that if every 650MHz Duron could do 800MHz with adequate cooling, then they'd be sold with a big cooler and an 800MHz sticker. If you assume that any CPU you buy isn't going to be good for more than a ten per cent overclock (which you really can do with just about any processor), then anything else you manage to get out of it will be a pleasant surprise.

650MHz Durons can indeed often run at 800MHz or more. If you've got one that doesn't want to play much above 700MHz, though, then, well, c'est la vie.



ⓘ You can be sure that this CPU is one cool customer

Toasty chips

Does room temperature have any effect on CPU temperature? My CPU temp is 55 degrees Celsius in the morning when the room temp is about 20 degrees, and 63 degrees when the room temperature is 25 degrees.

Ricko

Yes, ambient temperature has a significant effect upon the temperature of the CPU. In a normal computer with an ordinary heat sink and fan on the CPU it is a pretty simple relationship.

Air is moved through the case by the power supply fan and any other throughflow fans installed. That airflow, and the amount of heat produced by all of the stuff in the computer, determine the temperature of the air inside the case, and it's that inside air that's used to cool the CPU. The hotter the air outside the case, the hotter the air inside the case, and the hotter the CPU.

Given all the variables in computer case cooling - variations in CPU heat output, other heat sources, "heat soak" through the case, not to mention calibration errors in the CPU temperature monitor and whatever you use to measure the ambient air temperature - your results aren't at all peculiar.

Cooling system design is an exact science, but amateur PC cooling usually isn't. There's no point spending days to get maximum efficiency out of a cooling system when you can easily just provide a lot more cooling than the system needs...

...and have a grossly overpowered but highly effective solution.

⩾

Send your questions to io@atomicmpc.com.au or by post to:

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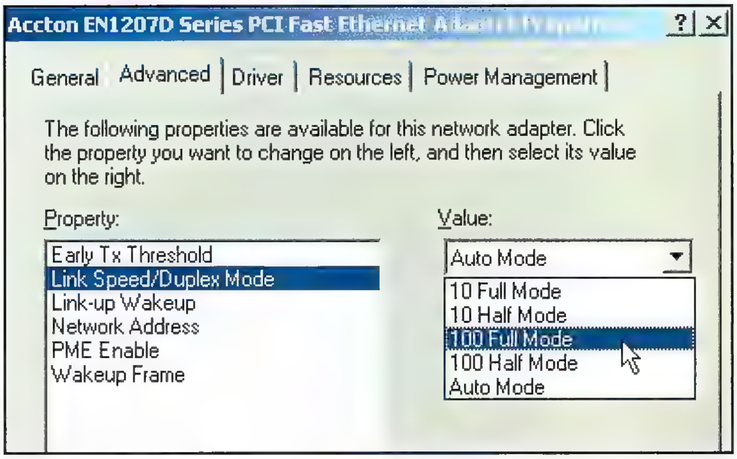


The following properties are available for this network adapter. Click the property you want to change on the left, and then select its value on the right.

Property:
- Early Tx Threshold
- Link Speed/Duplex Mode
- Link-up Wakeup
- Network Address
- PME Enable
- Wakeup Frame

Value: Auto Mode
- 10 Full Mode
- 10 Half Mode
- 100 Full Mode
- 100 Half Mode
- Auto Mode

Setting things up for full duplex mode

Duplex trouble

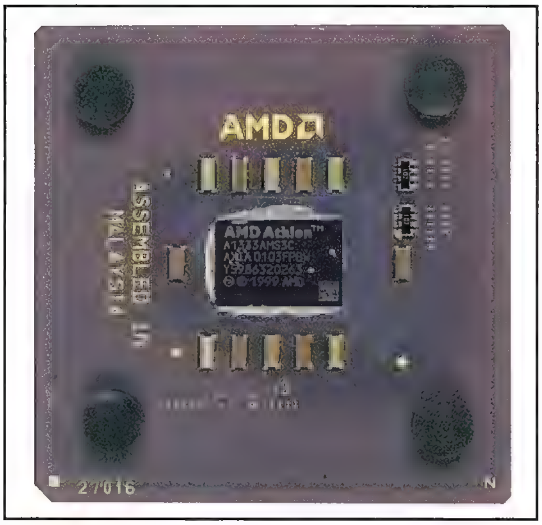
I have several networked machines at home. Three computers, one 10BaseT hub. It works fairly well but I have some problems. Namely, the network cards can do "full duplex", but it is way slower than standard mode, with or without the hub (I have a crossover cable too).

Also, one of the machines has an Internet connection, and I would like to share the connection with all of the machines on the network. How do I go about this?

Matt Coombe

10BaseT and 100BaseT Ethernet uses two cable pairs, each of which can carry one signal. In normal "half duplex" mode, data can flow either way, but only one way at a time. It's like people communicating with walkie-talkies.

In half duplex mode, the second cable pair's used for collision signalling. When two computers are trying to send data at the same time, the signal that tells them about the problem is sent on the second cable pair. When they hear that signal they both stop, pause for a brief random period of time, then try again. The random pause means they probably won't collide again, and it's all done automatically by the network cards themselves; the rest of the computer doesn't have to involve itself.



1.33GHz of AXIA Athlon lovin'. These new models are highly overclockable and are being bought up by the bucketload

In full duplex mode, both cable pairs are used for data, with one pair for each direction. This only works for two computers, or for computers that are connected directly to a port on a switch, not a hub.

Switches "segment the collision domain", and don't let things on their different ports talk over each other. Hubs just repeat everything they hear on one port to every other port.

If you use full duplex when you shouldn't, there's no collision detection and loss of data due to collisions has to be detected by higher-up network protocols. They take much longer to notice and request a resend, and that's why you will find yourself losing a ton of network performance.

Full duplex, though, should work over your crossover cable. If one or both of the network cards isn't doing it properly - and some cards don't - then that'd explain the problem.

Since most network transactions are very asymmetric - one side does almost all the talking - duplex makes little difference for home and small office purposes. So don't worry about it.

If you want to share your Internet connection, the easiest way is with Network Address Translation (NAT) software, such as the Internet Connection Sharing (ICS) that comes with Windows 98 Second Edition and later versions of Windows (WinME, Win2000). If you don't have one of those versions of Windows, try WinProxy (www.winproxy.com).

Picking a processor

I'm shopping for a new computer, but I don't know what CPU to get. Price isn't a big concern; I just want a CPU that'll be good for games and won't become outdated too quickly.

I read that the Athlon has a better FPU than the Pentium III, but the PIII's a better overclocker. What's better, Athlon or PIII?

Ben Chan

As I write this, with the 1.33GHz Thunderbird Athlon recently released to the Australian market, the faster Athlons are obviously the CPU to choose if you're building a new system and want mega-performance on a budget. The PIII isn't even in the running. A 1.13GHz PIII's the fastest you can get, but even the cheaper 1GHz PIII costs about as much as the 33 per cent faster 1.33GHz Athlon.

Athlons are faster than PIIIs at a given clock speed, and cheaper. Athlon motherboards cost a bit more than PIII ones, but not enough to close the price/performance gap.

Basically it's Athlon first, Duron second if you want a bargain system, daylight third. When upgrading an existing machine and keeping the motherboard it's a different story, but for a new system, get an Athlon.

As far as overclocking goes, the new Athlons bearing the magical word AXIA on the processor are pure gold, especially for a lower speed and hence cheaper model like the 100MHz FSB 1GHz. However the Coppermine core of the PIII really isn't happy about anything above a gigahertz.

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IRC

Go from IRC newbie to veteran in a a few hours with Simon Peppercorn

This is not a definitive guide or tutorial to IRC. It outlines some of the features of mIRC and the AustNet network. To provide an in-depth understanding of the functionality of mIRC or IRC in general, we would have to dedicate and entire magazine to that alone.

Let's assume that you have already downloaded, installed and set-up mIRC (www.mirc.com). We will also assume that you have a very basic understanding of IRC.

There are many kewl things that you can do in a chat room but there are two commands I want to point out to you first off. These are the ones you may find more useful than some of the more "funky" ones.

Firstly, to get a bit of information on a user in the channel, type /whois nickname in your channel screen and then in your status screen you should get something like:

```
phr33x is phr33x@coxxxxxxx-
a.blktn1.nsw.optushome.com.au * phr33x
phr33x on Virtual World as vw-
14792.optushome.com.au
phr33x is on #atomicmpc
phr33x using webmaster.ca.us.austent.org
Webmaster, Inc. - www.webmaster.com
phr33x has been isle 19secs, signed on Tue
Apr 03 22.:13:51
phr33x End of /WHOIS list.
```

In the first line you will see information on who the user actually is. The phr33x@coxxxxxxx-a.blktn1.nsw.optushome.com.au is user's full address. phr33x is specific to the user and becomes the "ident" The rest of the address is detail on the service provider they are using to connect to the server. At the end of that line appears whatever the user provided as their "Real Name" when they launched Mirc. So do not assume that the information is accurate or truthful!

The next line shows that this user uses Virtual World. This is accessible to all users who connect through AustNet, which according to AustNet protects the user from nukers. This process is transparent and requires no input from the user.

Line 3 is self-explanatory. Line 4 displays which server the user has come through to get to the channel in Line 3. Line 5 requires no explanation.

The other command I want to point out is /away. We have discovered that once users have connected to #atomicmpc many don't want to disconnect, even though they may be away from their keyboard.

It is a courtesy to let the other users know that you are not actively joining in the conversation even though you may be logged in to the room. If you type /away and put a short reason, (for example /away reading atomic) anyone who tries to /whois you or send you a private message you will get a notification that you are not paying attention to mIRC.

Many users combine this with changing their nickname to reflect that they are away, for example /nick Phr33x[AWAY]. or /nick T_B_A|a5l33p.

Colours

Plain black text on a white background get a bit boring so you can add some colour to your

Staying Blissful

As with any online communication, IRC relys on common human decency. The general boundaries of how far you can push your language and behaviour are, of course, dependant on what channel you are in, but the rule of thumb is simply try not to offend other people in the channel. If in doubt, take your cues from the other participants in the chat.

This runs from your choice of nickname through to the way you act. Sure the Internet affords anonymity, but the way you are seen and treated by others comes down to how you act towards them. If you decide to be abusive or just plain annoying don't be surprised if you are banned from a channel. Shit happens, but only if you cause it to happen.

Here is a rough top ten dos and don'ts of IRC:

1) Avoid language that is racist or sexist.
2) Don't abuse your fellow ircians.
3) If you really need to have cyber sex with another participant, FOR GOD'S SAKE do it in a private room. Apart from anything else other participants will be jealous of your online encounters.
4) Try and gauge how people tolerate swearing. Some rooms allow for any language whatsoever, but others try and keep it clean. It's up to you.
5) If a channel has rules, please read them. This may involve checking a Web site or using a trigger to display the rules.
6) Trout slapping is a good way of showing how non-l337 you are, keep it to a minimum.
7) Using bots to display your system specs, mp3 collections or the latest pr0n passwords may be fun, but they can get annoying. Moderate your usage or the moderators will moderate it for you.
8) A person's nick is sacred. Impersonators will always cop a lot of flack from other users, and it is a often a valid reason for being banned from a channel. The corollary to this is that it is a good idea to register your nick with the nickop.
9) Nothing is more annoying than a 50 year old man pretending to be a teenage girl. There are enough people like these around already. Just stay offline and slap your trout instead.
10) Sucking up to the ChanOps is a useful thing to do, but only in moderation.

```
Session Start: Tue
Apr 24 15:25:52
2001 *** Now
talking in
#atomicmpc ***
Topic is
'www.atomicmpc.com.
au' *** Set by
Aquilae on Tue Apr
24 02:19:07
<Bob working> ehy
cant you goto the
hospitel Aquilae ?
<nicole21> =)
<dibble>
(hopfully):)
 *** Prophey has
quit IRC Read
error to Prophey:
Connection reset by
peer) <Aurak> Why
can't you go?
Gunshot wound?
<nicole21> hey
GRiMEY
<Bob working>
GRiMEY is in the
house <GRiMEY> heya
all... <GRiMEY> op
me ya mugs
<Potatocake> `op
*** Prophey has
joined #atomicmpc
<Aurak> Hey GRiMEY
<dibble> broken keg
<Prophey> GRIMEY
BABEEE
<funneltrouble>
hey! <Aurak> Wb
Prophey<Bob working
> `op GRiMEYdaMug
<Potatocake>
`access *<Prophey>
ta rak
<Bob working> `op
GRiMEY ChanOP You
were oped on
#atomicmpc by
Bob working
 *** ChanOP sets
mode: +o GRiMEY
<Bob working> :P
<GRiMEY> ta
<Potatocake> weak
<Bob working> play
nice GRiMEY ***
ChanOP sets mode:
+o Prophey <GRiMEY>
I am trying to
write atm, but am
logging the chat
for our next issue,
so get funky ppl
 <Aquilae> why cant
i? i dont want any
```

> "They can do things like simply kicking you off, all the way to banning your entire domain"

conversation by pressing Ctrl+K and selecting a colour by clicking in the little box that pops up. If the box doesn't pop up. Check that the colour index has been enabled by going into your "options" and under "general" make sure that the box is checked that says "Control-K pops up colour index".

If you select two colours, then your test will appear as a coloured text on a coloured background. Just be aware that some combinations are particularly difficult to read.

Other control codes you can use in mIRC include Ctrl+R for reverse text, Ctrl+B for Bold, Ctrl+U for underlined and Ctrl+O to return to normal text.

ChanOP

The Ops can be identified by an @ next to their nick. With the exception of the #atomicmpc channel, Op status does not indicate anything other than their ability to perform tasks above and beyond the tasks that non Ops can perform. (I excluded #atomicmpc because the ChanOps there have earned that status due to their highest levels of integrity and ultimate, unquestionable l337n355!).

@Chanop is not a user however. It is actually an IRC server. In the case of #atomicmpc it is run by the AustNet services department automatically to ensure the integrity of the channel. It is a service that allows the registration of users and channels as well as executing various commands requested by those with appropriate Op access. In theory ChanOP cannot be banned, flooded or pushed off the channel.

A channel can only have one owner and this is generally the person who creates it. That person will have an access level of 200, which is the Channel Manager access level. Users with access levels above 190 will have the same abilities as Channel Manager.

It is often expected that Ops keep some sense of order in the chat-rooms. If you have been kicked then it is probably for good reason. So play nice...O.K?

That said, however, you should always respect an Op as they have God-like powers. They can do things like simply kicking you off, all the way to banning your entire domain, be that your ISP or even your country from the channel.

Assuming that you have sufficient Op status, and you find it appropriate to remove a user, a simple /kick command may suffice. The syntax is /kick #channel, Nick. So if I wanted to kick Flouncy, for arguments sake, from the atomic chat room, I'd want to type /kick #atomicmpc Flouncy.

If I wanted to ban Flouncy all together I would ban him by typing /ban #atomicmpc Flouncy. Remember, however, that the ban is on the "ident" and not the IP of the user. If Flouncy wanted to jump back into the channel he could just change his "ident" and rejoin. Hopefully by then he will have got the message and started behaving.

Ops have other powers too, such as promoting other users to operator and taking operator status away. To give user BobTheMonkey ops status, I ⪢

Basic Popup Menus (mIRC)

Popup menus can be very handy at times, a lazy way of identifying to a nickserver, giving op status to single or multiple users, custom kicks - just about anything can be done with a popup. All you are really doing is automating any command that can be typed in to the console. The actual popup menu is accessed by right clicking on the specified area, for the examples below you would select a nickname off the list – right click - select Action, then select the action you want.

A simple popup – Select a name from the nicklist and Dispute their 733+/\/355

1) Press Alt P – select the popup tab and select nicklist from the view menu
2) At the top of the nicklist popup window enter this text
3) Action (Enter)
4) .Dispute Leetness:/me Disputes $1's 733+/\/355 (Enter) **NB1
5) .Bitches:/me Screams: You are all my bitches NOW......(Enter)
6) .Bennet:/Say ^k Bennet cant play CS to save his life (Enter) **NB2
7) click ok

Another example is to make a logon popup – follow the same procedures as before but place the popup in the status window – change step 2 to Status – scroll to the bottom of the list and enter this text

1) Logon
2) .Nick 1 Sarge:/nick Sarge | /msg nickop@austnet.org identify password** NB3

**NB 1: You will notice a period at the start of the lines under Action – these represent menu levels.
**NB 2: Replace ^K with control + K key combination.
**NB 3: This uses the Pipe character (Shift \) – it will process two commands in one line

```
family to know what
happened...
hospital report
leg in cast because
of garbage truck
incident... cost
$600 <--no
thankyou, id rather
a crooked leg
<Prophey> GRiMEY:
what doing nigga
<Aquilae> and hello
GRiMEY <dibble>
wha? <Bob working>
what? ***
Bob working is now
known as
BobTheMonkey
<BobTheMonkey> my
ass buns
<BobTheMonkey>
b u r n s
<BobTheMonkey> -]
<Aurak> Garbarge
truck? WTF?
<Prophey> I like
bobs ass <dibble>
at least we will
notice u aqua
<BobTheMonkey>
everyone wanst a
peice of my ass..
 * Aurak agrees -
bob has nice ass
buns <Prophey>
Aquilae: doesn't
cost a thing if its
a public hospital
*** BobTheMonkey is
now known as
Bob NiceAss
<Prophey>
Bob NiceAss: its
mine bebee <Aurak>
Again - garbarge
truck?
<Bob NiceAss>
hahaha <Aquilae>
prophey: do i get
full privacy?
 <Prophey> Aquilae:
yup <Bob NiceAss>
whats the log for?
<Prophey> well..
depends how old u
are <Prophey> over
18 then yes
<dibble> sitting on
<Bob NiceAss> well
say stuff people
*** Bob NiceAss is
now known as
BobTheMonkey
<Aurak> I thought
if you had an odd
```

would type /mode #atomicmpc +o BobTheMonkey.

Then to take it away just use –o in the same command. This is also known as Opping and Deopping. (By the way...BobTheMonkey already is an Op of the #atomicmpc chat room, and all users are expected to bow down to his l33tn355).

Fortunately, mIRC doesn't expect a user to remember every single mode and command. Included in the application is mIRC "Channel Central". To use this, double click in the channel window.

This will allow users with the appropriate level to do things like un-ban users, set the maximum number of users in a channel, change the topic, and other kewl stuff.

Modes

Channels, by default, are public. Anyone can see it and anyone can join it. If you are in a public channel, anyone can find you if you don't set your personal user mode to invisible. There are modes that you can set to restrict access to a channel.

For example:

/mode [channel] +i (invite only)
/mode [channel] +p (private)
/mode [channel] +s (secret)

An invite only mode means that the only way you can join that channel is to be invited by an Op.

Private channels can be seen in the channel list. If a person searches for you they can see that you are on a channel but they cannot tell which one. The only way you could be found is if that person searches every channel individually.

To join a secret channel you must know the exact name of the channel to join. It does not show up in the channel list. No one knows you are in there except for other users who are in the same channel.

You can apply certain modes to yourself.

For example:

/mode [your nick] +i (invisible to everyone except those who know your nick
/mode [your nick] +s (allows you to receive server notices)
/mode [your nick] +o (IRC Op status – Which must be already given to you by another Op at an appropriate level.)

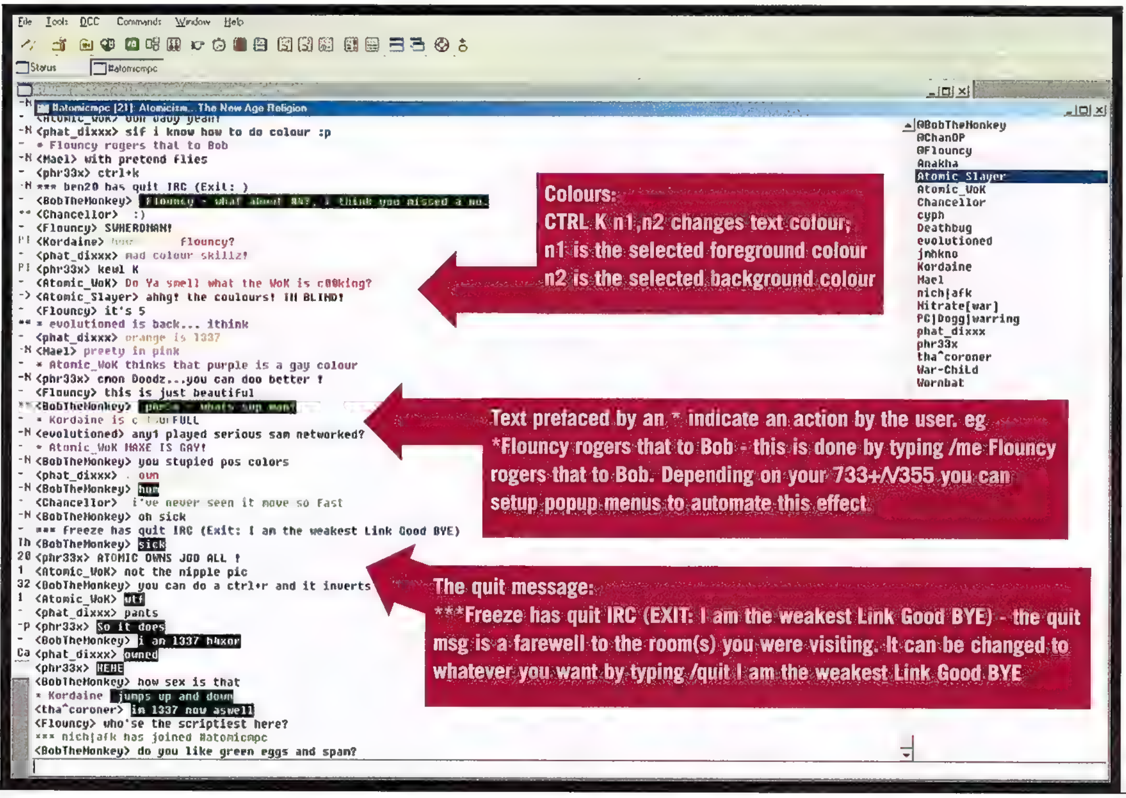
Scripts

As you grow to love IRC you may want to experiment with scripts. These are basically customisations of mIRC, contained within .ini files. They have been edited to perform series of predefined commands.

There are different types of scripting. The most simple is the use of Aliases. You can use Aliases to create customised commands from a shortcut. A little bit like a macro.

Scripts themselves can grow to be quite complicated, but when used correctly will amaze and

> "If you are in a public channel, anyone can find you if you don't set your personal user mode to invisible."



File Tools DCC Commands Window Help
Status
#atomicmpc
#atomicmpc [21]: Atomicizm...The New Age Religion

```
-N
-  <Atomic_WoK> ooh baby yeah!
-N <phat_dixxx> sif i know how to do colour :p
-  * Flouncy rogers that to Bob
-N <Mael> with pretend flies
-  <phr33x> ctrl+k
-N *** ben20 has quit IRC (Exit: )
-  <BobTheMonkey> Flouncy - what about 007, i think you missed a no.
** <Chancellor>  :)
-  <Flouncy> SWHERDMAN!
PI <Kordaine> how       flouncy?
-  <phat_dixxx> mad colour skillz!
PI <phr33x> keul K
-  <Atomic_WoK> Do Ya smell what the WoK is c00king?
-> <Atomic_Slayer> ahhg! the coulours! IM BLIND!
-  <Flouncy> it's 5
** * evolutioned is back... ithink
-  <phat_dixxx> orange is 1337
-N <Mael> preety in pink
-  * Atomic_WoK thinks that purple is a gay colour
-N <phr33x> cmon Doodz...you can doo better !
-  <Flouncy> this is just beautiful
** <BobTheMonkey> phr33x - whats sup man!
-  * Kordaine is colourFULL
-N <evolutioned> any1 played serious sam networked?
-  * Atomic_WoK MAXE IS GAY!
-N <BobTheMonkey> you stupied pos colors
-  <phat_dixxx>  own
-N <BobTheMonkey> hum
-  <Chancellor>  i've never seen it move so fast
-N <BobTheMonkey> oh sick
-  *** Freeze has quit IRC (Exit: I am the weakest Link Good BYE)
Th <BobTheMonkey> sick
20 <phr33x> ATOMIC OWNS JOO ALL !
1  <Atomic_WoK> not the nipple pic
32 <BobTheMonkey> you can do a ctrl+r and it inverts
1  <Atomic_WoK> wtf
-  <phat_dixxx> pants
-p <phr33x> So it does
-  <BobTheMonkey> i am 1337 h4xor
Ca <phat_dixxx> owned
   <phr33x> HEHE
   <BobTheMonkey> how sex is that
   * Kordaine  jumps up and down
   <tha^coroner> im 1337 now aswell
   <Flouncy> who'se the scriptiest here?
   *** nich|afk has joined #atomicmpc
   <BobTheMonkey> do you like green eggs and spam?
```

```
@BobTheMonkey
@ChanOP
@Flouncy
Anakha
Atomic_Slayer
Atomic_WoK
Chancellor
cyph
Deathbug
evolutioned
jmhkno
Kordaine
Mael
nich|afk
Nitrate[war]
PC|Dogg|warring
phat_dixxx
phr33x
tha^coroner
War-Child
Wornbat
```

Colours:
CTRL K n1,n2 changes text colour,
n1 is the selected foreground colour
n2 is the selected background colour

Text prefaced by an * indicate an action by the user. eg *Flouncy rogers that to Bob - this is done by typing /me Flouncy rogers that to Bob. Depending on your 733+/\/355 you can setup popup menus to automate this effect

The quit message:
***Freeze has quit IRC (EXIT: I am the weakest Link Good BYE) - the quit msg is a farewell to the room(s) you were visiting. It can be changed to whatever you want by typing /quit I am the weakest Link Good BYE

```
accident they got
the cops involved?
Wrong?
<BobTheMonkey> im
going home in 1
hour ay
<BobTheMonkey> and
then im OFF TO QLD!
<Aurak> Stuff
people.. =)
<BobTheMonkey>
Sweet <Prophey>
Aurak: nop
<Prophey>
BobTheMonkey: see
you up ere
 <Aurak> Yay! to
live bob? <Aurak>
Ok, cool..
<BobTheMonkey>
Prophey : you libe
in QLD? <Prophey> I
certainly libe in
QLD <BobTheMonkey>
i know phr33x flyed
up there today
<Prophey> so does
dixx <BobTheMonkey>
where abouts?
<Aquilae> ok, ill
say for last time:
on the weekend
there was a huge
party in Gosford; i
attended, got so
drunk on Cougar
bourban and wasted
that i got my leg
runover by the
garbage truck <-- 3
broken toes and
bruised shinbone (i
think) although
more could be
broken
<BobTheMonkey> sick
<Aurak> ME too...
<BobTheMonkey>
brisbane? <Prophey>
near frozen
<Prophey> know
where pea lives?
<BobTheMonkey> nope
<Potatocake>
0,15<14>15,14<1>14,
1<15,1 For My8
List15:1501 files:
5682MB) and8 DCC
Status15, Type8
@Potatocake 15and8
@Potatocake-stats
15[(80/315) Slots
Taken (80/1515)
Ques Taken]15
[8Open Slot Ready15
][Bandwidth in
```

Command Description

Replace text in *italics* with appropriate word

/list	Lists AustNet channels, number of users and topic
/join *#channel*	Allows you to join in a conversation with other people who are also on the channel. If the channel did not already exist, it will be created for you and you will be in charge of it
/part *#channel reason*	Will leave the channel that you specify
/names *#channel*	Shows the nicknames of all users on the specified channel
/nick *nickname*	Change your nickname (limited to 15 characters)
/quit *reason*	Disconnects you from IRC, and leaves a reason
/whois *nickname*	Displays information on the specified nickname
/away *reason*	Leave a message explaining that you are not currently paying attention to IRC
/msg *nickname*	Sends a message to another nickname
/invite *nickname channel*	Invites another user to a channel. You must be on the channel and have ops for this
/topic channel *topic*	Changes the topic for your current channel
/query *nickname*	Starts a private chat with the nickname
/whowas *nickname*	Shows the user details of nickname after they have left the server
/me *action*	Sends a user action to the chat window, eg /me Disputes Tremayne's 733+/V355 – would be displayed as *Sarge Disputes Tremanyne's 733t/V355
/server *server*	Change server - /server irc03.icq.com 6667 – would change to the ICQ IRC servers
/mode channel *mode*	The Modes for channels are: m - make channel moderated s - make channel secret p - make channel private l - make channel limited, where number is the maximum number of users allowed t - make channel topic limited o - Makes nick a channel operator i - channel is invite only n - No external MSGs to the channel are allowed (message disabled) k - Password for a channel

astound the less skilled users. On the flipside, unrestrained script use can get very annoying.

Scripts are widely used for a range of tasks. Common scripts are designed to protect you and/or others from attacks while in the chat rooms, such as flooding. Scripts are also used to create an fserve, which is essentially a file server used in IRC.

A guide to writing and using scripts would take up a significant portion of this mag. Instead, I recommend that you go to www.pairc.com/tutor for an indepth tutorial on scripting in mIRC.

Bots are another common form of a script, which respond to pre-defined commands or events. Different types of bots carry out different commands.

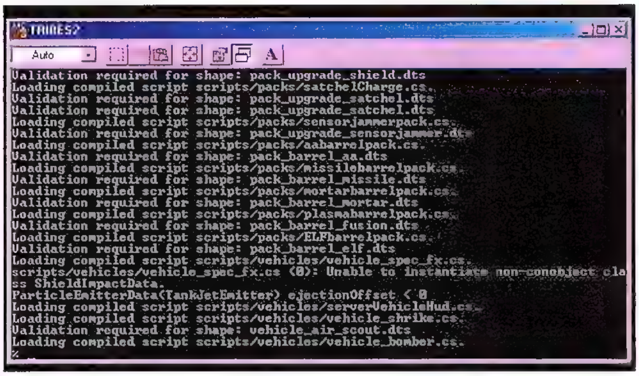
For example, Channel bots carry out the more simple tasks such as kicking, Opping, Deopping and so on. Be careful about using a bot that gives out Ops, because someone could become an Op and kick then ban you, denying you access to your own channel, obviously bad.

For a full list of commands available in mIRC go to www.mirc.net. You will find there heaps of funky little tricks, tips and shortcuts. The other place worth checking out is www.austnet.org, where you will find guides and FAQ's that take you deep into the bowels of IRC. If you feel the need to tinker even further with scripts and bots, check out www.xclalibre.com or www.scripterz.com for more information. ▢

```
Use:8015cps]
[HighestCps
Record:8 3.115kb/s
by8Ratzniuml5
[Total Files
Served:8 615]
14,1>1,14<15>14,15<
0> <Aurak> Garbage
truck! LOL ac
<BobTheMonkey> i
dont know where any
of your bitchers
live <Prophey>
Aquilae: just tell
them you bloody
dropped a table on
it <Kamian
potatocake
<Prophey
BobTheMonkey:
wheres yo womar
live ?
<BobTheMonkey
carindale <Aurak>
Some bastard
dropped a garbage
truck on it ***
jen11 has joined
#atomicmpc
<Aquilae> prophey:
i got tire burns
all over my right
leg... not m,any
tables do that
<BobTheMonkey> want
to meet up some
place ?
<BobTheMonkey> and
have a beer?
<Prophey> sure
<BobTheMonkey> sick
<Prophey> i'll
bring dixx so you
can see his broken
arm <Prophey>
*chuckle* <Aurak>
Mmm, beer Man it
sucks living up
north...
<Potatocake> 5,14-
0,1 I havl5e jul4st
13f11i9n8i4s13h11e9
d14 se15ndi0ng
Potatocake[04-19-
01]-MM.txt 14to0
Kamian8 3 15slct(s)
0Empty15! Grab one
fast! 14 -
5 <BobTheMonkey>
haha <BobTheMonkey>
PM.. <jen11> so can
we plug our web
sites if this is
getting logged?
<Aurak> Nope :P
<Prophey> jen11: no
```

SET UP AND RUN A TRIBES 2 SERVER

David Kidd has entered the game and wants to share some server secrets with you.



```
Validation required for shape: pack_upgrade_shield.dts
Loading compiled script scripts/packs/satchelCharge.cs.
Validation required for shape: pack_upgrade_satchel.dts
Validation required for shape: pack_upgrade_satchel.dts
Loading compiled script scripts/packs/sensorjammerpack.cs.
Validation required for shape: pack_upgrade_sensorjammer.dts
Loading compiled script scripts/packs/aabarrelpack.cs.
Validation required for shape: pack_barrel_aa.dts
Loading compiled script scripts/packs/missilebarrelpack.cs.
Validation required for shape: pack_barrel_missile.dts
Loading compiled script scripts/packs/mortarbarrelpack.cs.
Validation required for shape: pack_barrel_mortar.dts
Loading compiled script scripts/packs/plasmabarrelpack.cs.
Validation required for shape: pack_barrel_fusion.dts
Loading compiled script scripts/packs/ELFbarrelpack.cs.
Validation required for shape: pack_barrel_elf.dts
Loading compiled script scripts/vehicles/vehicle_spec_fx.cs.
scripts/vehicles/vehicle_spec_fx.cs (0): Unable to instantiate non-conobject cla
ss ShieldImpactData.
ParticleEmitterData(TankJetEmitter) ejectionOffset < 0
Loading compiled script scripts/vehicles/serverVehicleHud.cs.
Loading compiled script scripts/vehicles/vehicle_shrike.cs.
Validation required for shape: vehicle_air_scout.dts
Loading compiled script scripts/vehicles/vehicle_bomber.cs.
%
```

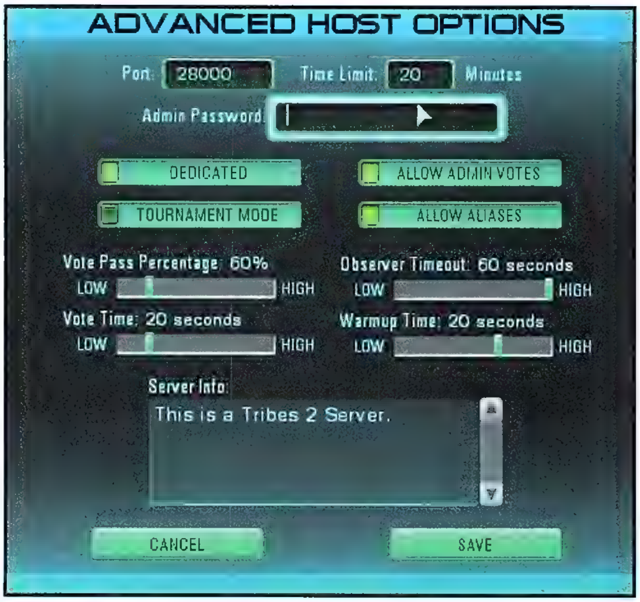
We love Tribes 2. Turn to the review in this issue to see just how much. But loving a game is not enough to keep it alive, so we, as gamers, need to give something in return. One way to do this is to get your own dedicated server up and running. More servers available will not only attract new gamers, but also provide the variety and resources available for running clan matches, leagues and mods. The original Tribes, Counterstrike and the disgustingly woeful Codename Eagle have all survived due to support of the keen, and perhaps overly so, online gaming community.

So let's get to it. I'm sure a large portion of you have, at some time played online. If you haven't then I'm hoping you have some idea of game servers and their function. Think of the following situation: twenty people need to talk to each other but are isolated from each other in cubicles. The only way to communicate is to talk to a special 'host' who must pass on the message to everyone else. The host has no soul, and can't really contribute to the conversation in the same way as the guests, or clients. Bringing this back to gaming, the host receives the data the client transmits, say player location and gives the information to the other clients. While you're moving around the game you are also receiving more information from the server about the other clients. This constant flow of data, back and forth more or less represents the role of the game server.

ⓘ Starting a Tribes 2 Server

A dedicated Tribes 2 server can be created within the game by simply clicking 'Host', choosing the map and then, after going to 'Advanced Options' and selecting map length and passwords, you will be forced to exit Tribes 2. From here, you'll be looking at a DOS window, which is now your server console. You can also run a non-dedicated server from inside the game, but in order for people to get the best possible experience from the game then a dedicated server is definately the way to do things. The other way of running a dedicated server is the hardcore Atomic way of doing things that takes you straight to the DOS console from the command line.

To start a dedicated server, find the Tribes 2 icon in your Tribes 2 directory and select Create Shortcut. In the Target box add the following shortcut: C:\games\Tribes2\GameData\Tribes2.exe –dedicated If you want to start a dedicated server on a LAN you must add in '-nologin' to prevent it from attempting to talk to the online Master Server. It must go before any other extension i.e. C:\games\Tribes2\GameData\Tribes2.exe –nologin –dedicated Included with Tribes 2 is a handy utility called InfiniteSpawn that allows automatic restarting after a server crash, which will reduce the amount of hands-on work required. Because InfiniteSpawn is obviously a more superior way to host a server, we'll be referring to this for the remainder of the guide. C:\games\Tribes2\GameData\ispawn.exe 28000 Tribes2.exe –dedicated The port number 28000 will be explained in the next step. Other arguments that can be added to the command line are: -bot x where x equals the number of bots you want running and; -mission {mapname} {mode} By combining all of these arguments you should get something that looks like this: C:\games\Tribes2\GameData\ispawn.exe 28000 Tribes2.exe -dedicated -bot 10 -mission sanctuary CTF



Port: 28000
Time Limit: 20 Minutes
☐ DEDICATED
☐ ALLOW ADMIN VOTES
☐ TOURNAMENT MODE
☐ ALLOW ALIASES
Vote Pass Percentage: 60%
Observer Timeout: 60 seconds
Vote Time: 20 seconds
Warmup Time: 20 seconds
Server Info: This is a Tribes 2 Server.

Console Commands

setlogmode(1) - Sets up a statistical log about the server
quit() - exits the server
export("*", "prefs/allvars.cs", false) - exports a file containing the current server variables
addbots(n) - adds 'n' bots
loadmission(map) - Changes the map
restartmission() - Restarts current map
bottomprintall("Message",numSeconds) - Allows you to print a message on the screen as well as setting the message duration.
listplayers() - Lists the players on the server, with their ID
ban(ID) - Bans a player with specified ID
kick(ID) - Kicks a player with a specified ID

Useful Online Sites
Tips, scripts and any other admin info.
www.t2dedserver.com
Huge forums for anything Tribes related.
http://forums.planettribes.com/
Home of Tribes 2 Serverstat.
www.augustknights.com/t2serverstat/
TriCon2 is a simple server console GUI.
www.tricon2.com

Controlling the Server

Now that we have the mundane out of the way, let's look at configuring and controlling what happens on it. Basically there are two ways of controlling the state of your server: server preferences and console commands. Most, if not all of the commands in the server preferences file can be entered into the console and changed on the fly. Map changes, kicks, bans, and messages can all be altered through the server console. See the boxout to get an idea of common console commands. Remember, if you keep getting syntax errors you must enter the command exactly as its written i.e. with semicolon at the end. Unfortunately we don't have enough space to look at all the .cs commands but most are self-explanatory.

Map Cycles

The Tribes 2 map cycles are, well interesting. Because you have different play modes like CTF, DM etc available on the same map, the map list can get confusing. Most of us would be happy to just let the default list run through but to give that personal touch, or to admin a clan match it's helpful to know how to turn maps on and off. Let's look at a section from a serverprefs.cs file:

```
$Host::MapPlayerLimitsFirestorm_CnH = "-1 24";
$Host::MapPlayerLimitsFirestorm_CTF = "-1 24";
```

This means that for the Firestorm Capture and Hold map, it will load in the cycle if there are between –1 and 24 players and likewise for Firestorm CTF. If we want to alter this to have a minimum of 8 people before the map starts simply alter the first value to '8'. To skip or remove a map from the cycle change the min/max value to '-1,1'. Finally, if the game mode is set to CTF at boot up (see step 1) then only CTF designated maps will run.

A separate article would be required to offer a fully detailed explanation of the map cycles but this should give you some of the basic ideas.

Making Things Pretty

Although it's hard to make a DOS prompt pretty, there are applications available that can help. The new T2Serverstat located at www.augustknights.com/t2serverstat offers an excellent program that lets you see exactly what's going on your server from player lists, scores and map settings. Another easy to use front end is TriCon2. It shouldn't be too long before more server front-end applications start popping up. Admins will probably remember EZConsole and BWAdmin for Tribes. Although BWAdmin has been disbanded, there should be a new version of EZConsole for Tribes 2 out by the time you read this.

After following these steps do not be surprised if things don't work out straight away. Setting up and maintaining a server can be a daunting and overwhelming task. There are some excellent online resources available for your questions. Lastly, listen to the people that play on your servers. There's no point in running old or unpopular maps or having a map time set to three hours. Find out what the popular servers are doing and, as well having an increased of well being, you'll have a permanently full server.

Server Preferences

There are two ways to create a serverprefs.cs file. The easiest way is to start a network game from within the game. This will output a serverprefs.cs file to your \gamedata\base\prefs directory under Tribes 2. This will have all the basic commands to get a simple server running as well as the assigned port number. Note this number as it will be used when booting up the server. You can then use custom .cs files with the following command:

```
C:\games\Tribes2\GameData\ispawn.exe
28000 Tribes2.exe –dedicated –serverprefs
prefs/custom.cs
```

THE RIGHT WAY: PC CASE PAINTING

Luke St.Clair and Bennett Ring suit up for some painting action

You've no doubt seen the tragic results that occur when painting a PC goes bad. Looking more like a 1972 Corolla with a shoddy paint job than a glistening pillar of pure power, a bad paint job can destroy any semblance of coolness that the owner may have once possessed. At atomic, we see many a poor paint job via the numerous Hot Box wannabes and we kept wondering, why? Because we know that with a little thought and the right technique, painting your box is one of the simplest ways to beautify and personalize your PC. It also happens to be very easy on the wallet; so really, you don't have any excuses anymore about why you have a boring beige brick instead of a flamboyant fluoro personality statement.

ⓘ The Painter's Kit

Painting your case requires very little in the way of equipment, and the gear you will need all retails at a very low cost (well, when you compare it to anything else for your PC). You will need two cans of your chosen paint, as one usually isn't quite enough. It's always better to have too much paint rather than too little, because if you run out after one can and can't find the same paint again, you'll have to start the job from scratch. This can be especially painful if you've completed ninety per cent of the job. Masking tape comes in handy, and for once you will actually use it for its intended purchase (ever wondered why it begins with the word masking?). A clean cloth as well as an acetone-based cleaner should suffice for cleaning up all the surfaces to be painted. A single sheet of auto sand paper, fine type-400 will be enough for the small amount of sanding that you'll need to do.

≥

WHICH PAINT IS BEST?

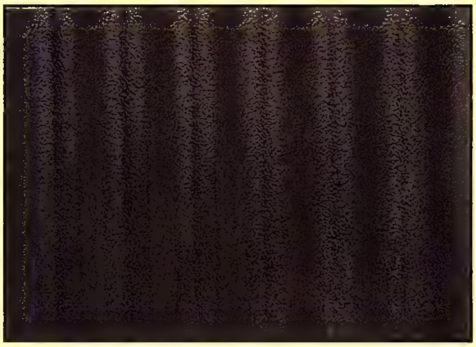
We tested several different paint types to determine which is the best type of paint to use. To test these we sprayed a small section on both steel and plastic. A spare case side was used for the steel tests, while the front door from an old Hewlett Packard machine was used for the plastic tests. We looked at how easy the paint was to apply, how evenly it applied to the surface, its fan quality, how well it adhered to the surface and how attractive the finish was. When talking about a can of spray paint's fan, we are talking about the jet of paint that it expels. A wide and even fan is best for painting, as this will give you the best end result.

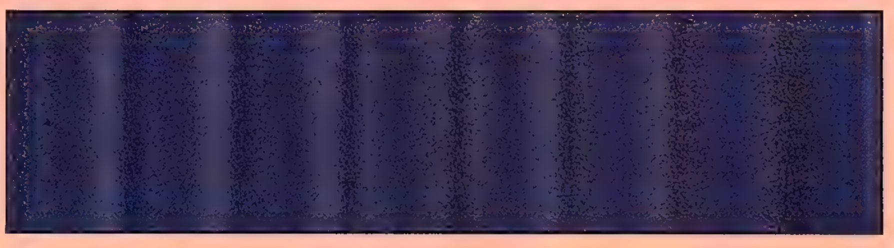
AUSTRALIAN EXPORT PAINT

COST: $2.00

RATING: 5th

For all the cheapskates out there, we tried some budget enamel gloss black spray paint from the local two-dollar shop. And the old saying "You get what you pay for" rang true with this stuff. While it did apply evenly, the final coat still looked blotchy, and took longer than usual to dry. Avoid the el cheapo brands at all costs!





TAMIYA COLOR LEXEN HOBBY SPRAY PAINT

COST: $7.00

RATING: 4th

We're sure many of you have a few spare cans of model making paint lying around that you'd think would be great for case painting, so we included some Tamiya Color Lexen Hobby spray paint. This is designed for the painting of plastic lexen bodies, and can handle significant amounts of flexing. This was approximately $7 per can, and applied easily. Unfortunately it didn't look quite as attractive as the other paints.

PLASTI-KOTE ENAMEL

COST: $9.00

RATING: 3rd

The first paint we tried was a plain enamel gloss black. The Plasti-Kote brand applied well with an even fan and dried quickly. The final coat looked even and had a clean overall appearance.

PaintMark2001

After spraying each paint on our test pieces, it was time to perform a couple of tests. First up was the flex test, where we bent the plastic at an almost 180-degree angle. This was to see if the paint would flake. Even though we don't expect you to intentionally bend your PC in half, it is nice to know that the paint will be able to handle minor flexing.

Most of the paints could handle a 90-degree bend, but after that they all flaked with the exception of the Tamiya Color Lexen paint and the automotive vinyl paint.

Then it was time for the scratch test, where we scratched each section with a fingernail to test which would be most resilient to knocks and scrapes. The last thing you want is for your lovely new paint job to be disfigured merely by rubbing against the velour trim of the back seat of your car. The acrylic paint with a clear finish overcoat held up the best, followed by the automotive vinyl paint.

Finally it was time for the aesthetic test – which of the finishes looked the best? Although you may not be able to tell from the photos of the test sections, there was a definite difference between the paint finishes. Easily the most attractive was the Automotive Vinyl paint. This had the smoothest, most even finish. Considering that this paint did so well in all three tests, we decided to use it for the job. Sheesh, using car paint on your PC, what's next?

HOLT'S DUPLI-COLOR AUTO SPRAY

COST: $10.00

RATING: 2nd

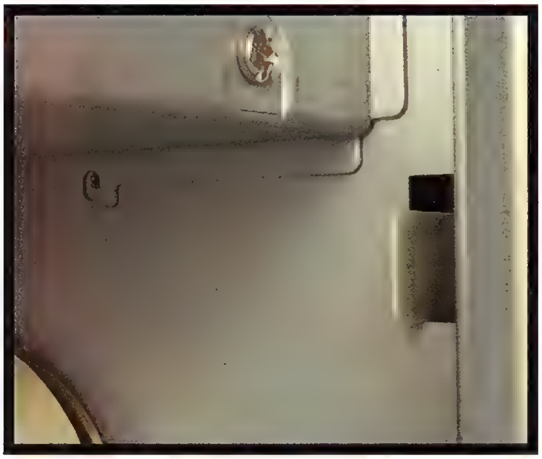
We needed to test some acrylic paint, to see how they compared to the enamel paints. We used Holt's Dupli-Color Auto Spray, choosing a matt black finish. The beauty of this acrylic paint is that it is much simpler to correct any small mistakes you might make, as it requires much less re-spraying to cover any sanded back patches. The dry time of this acrylic paint was also much faster than the enamel paints. We found that more coats of this were necessary than the other paints to ensure a solid finish. Although this paint is specifically made for metal (provided a primer base is used), it worked well on the plastic. The finish was very professional, but to get a glossy look we used a clear finish overcoat, using the same brand of paint.

MOTOSPRAY VINYL SPRAY

COST: $16.00

RATING: 1st

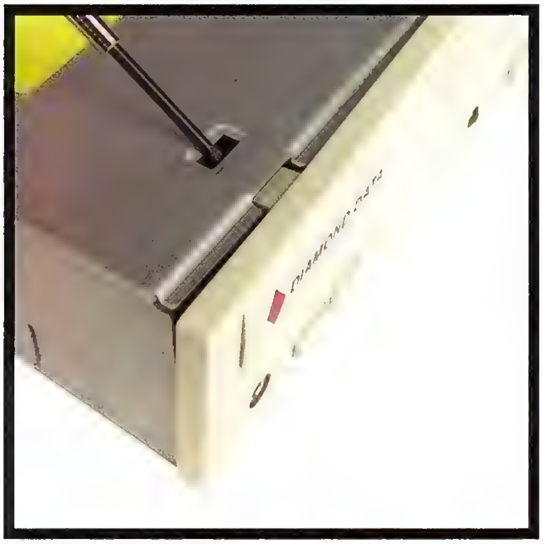
Next up was grey automotive vinyl paint, a special type of paint designed to grip well to both vinyl and plastic. It is also fine to use on steel. This paint was a joy to use, having an even and wide fan. It also proved very difficult to cause any paint runs. At around $16 per can, the Motospray paint was the most expensive of all the paints, but the final finish stood head and shoulders above the rest. Unfortunately, it comes in a limited range of colours, but we ended up using the silver colour for our final paint job.



Face off

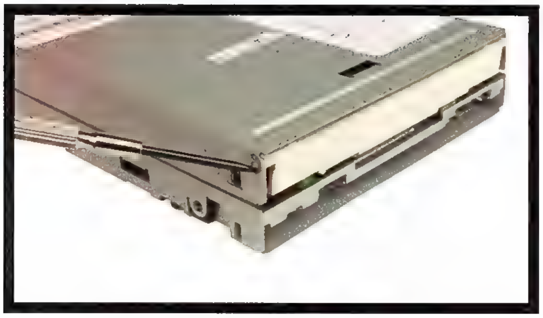
The first thing you will need to do is remove the front plastic face of the case. To do this, first remove the steel case cover. Then look at the rear of the front steel face for the plastic clips that are holding the facia in place. You can see what these clips look like from the shot to the left. There should be four to six of these clips.

Simply push the side of each clip in to unlatch, detaching all of them until you can remove the face. You might need to pull the plastic facia slightly forward after unclipping each latch, to stop them reinserting themselves. Once this is off, remove the power and reset buttons from their plastic mounts. Also remove your power and hard disk LED's from the plastic facia.



The CD drive face

After removing the plastic face, you will need to remove any drives you have installed in your PC, be it a CD drive or a floppy disk drive. Sometimes you will actually have to remove these from your system before the front plastic facia will detach. Once you have removed the drives, it's time to dismount their plastic faces. If you check our shot, you'll see that the CD drive face is mounted similarly to the main plastic face of your case. Simply find each latch point that holds the face in place, and insert a screwdriver to pop it out. If you find you need to use force to remove the cover, make sure you have dislodged every clip, as the face should be simple to remove once these have been unclipped. The plastic covering on the drive tray usually slides straight off, without the need to unclip any latches. The tray cover on the CD-ROM drive that we painted simply slid downwards to dismount.

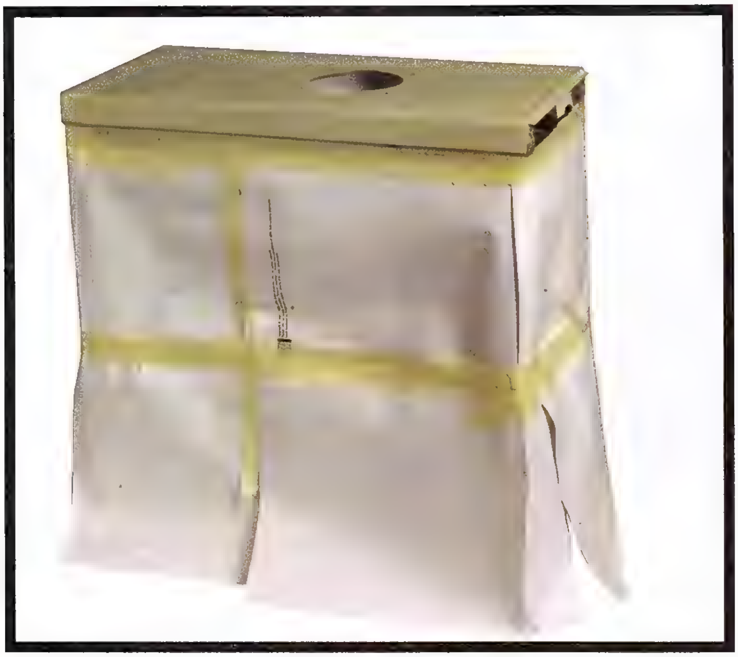


Defacing the floppy

After removing the plastic face on the CD drive, it's time to remove your floppy disk drive face. Nothing spoils a nice paint job more than a beige floppy face. This is exactly the same process as removing the CD face – simply find where the face clips onto the drive and, using a screwdriver, pop the latches out. You will then need to remove the floppy drive's swinging door.

To do this, simply insert a small screwdriver head into the hole that houses the end of the swinging door and push the end inwards, as illustrated in the below left shot. When the door pops out, take note of the position of the spring that will be on one end of the door, so that you will know which way it is positioned come re-assembly time. Take care not to lose the spring when the door initially comes out, as these little blighters have a nasty habit of flying free of their mount as soon as the door pops out. Finding one of these tiny springs in shagpile carpet certainly isn't easy.

When the drive face is off you will also need to remove the drive's eject button. To remove this button, simply unlatch it from its metal mount. Just as with removing all of these faces, force should not be necessary if all the latches are unclipped.



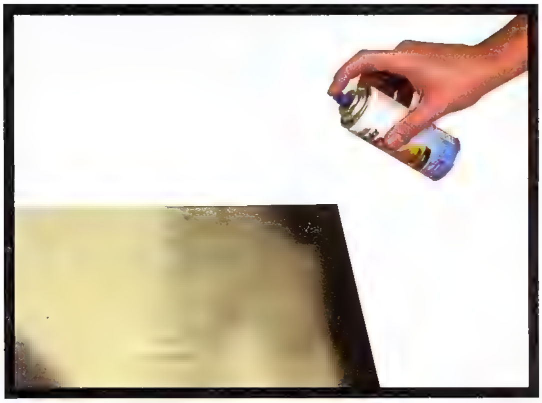
The Masked Avenger

You now need to remove the case cover/sides from your PC. The case we used had removable sides, but the top section was actually riveted to the frame. While Luke wanted to cut the top off by drilling out the rivets holding the top in place, I was a little hesitant about hacking the roof of my case off.

Therefore we needed to mask up the case so we could paint the top without paint getting into the interior. At this stage it would also be wise to remove all of the components within your case, although if you mask it well enough this isn't crucial. Then mask off the case using masking tape and paper, making sure there are no gaps at all, as can be seen from the shot to the left.

Clean your act up

Now that you have your case totally disassembled and masked up, it's time to prepare the surfaces before applying the paint. It is crucial you do this thoroughly, otherwise small blemishes and patches will show up in the paint job. Lightly sand the steel parts of the case, just enough to remove the shine from the current paint job. Make sure you also sand back any scratches or dents in the paint job caused by previous wear and tear. You don't want to sand too much, as this could leave a pattern that will show through the new paint job. Wipe down the case to remove any paint dust, and then use an acetone-based cleaner lightly on all surfaces to be painted, including your face plates. It is imperative that you use only acetone-based cleaners, not soap-based. If you use a soap-based cleaner it will leave an oily residue that can't be painted on. Make sure the rag is only slightly dampened with the cleaning fluid, as this is corrosive to plastic.



It's all in the technique

After a thorough preparation of the surfaces, it's time to bust out those neglected graffiti skills and start spraying. It is best to use an indoor area, or at the very least an undercover area.

Make sure that the area you will be using is well ventilated, unless you are trying to cultivate a paint sniffing habit. It is best to spray on warmer days, as cold surfaces are more difficult to paint on. Lie out plenty of newspaper, and then spread out everything that needs to be painted so that it is flat on the ground. This helps to prevent the paint from running and also makes the paint sit more evenly when we start applying thicker coats.

Shake the can extremely well before holding at a distance of approximately 30cm away. Hold the can at an angle of approximately 45 degrees when painting. If you find the paint starts pooling or running, move the can further away from the surface that you are painting.

After each successive layer, make sure you clean the nozzle of the spray can thoroughly to stop paint splattering. Also, after each coat, turn the can upside down and release a short burst. This will release a burst of air without paint, which should keep your can's nozzle clean and clear. In case you haven't got the message yet - KEEP YOUR NOZZLE CLEAN!

>

The undercoat

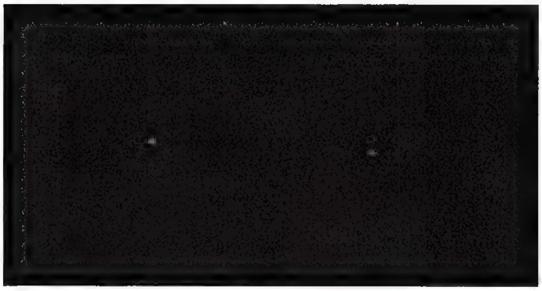
Before we start applying thick coats of paint, we need to build up a thin layer that will grip to the steel or plastic. You can see in our shot just how thin this dusty layer is (we used black paint to best illustrate the technique). After thoroughly cleaning the nozzle of the can to stop splattering, spray one dusty coat over every surface, before allowing it to dry. Then apply another dusty layer. Make sure you paint over and around edges, to help the paint bond in these problem areas.

The atomic secret – Overlap

Once you've allowed the two dusty base coats to dry, it's time to start laying down the paint in earnest. Using long, horizontal strokes, starting at one side, spray a thicker layer of paint that totally covers the previous layers. Don't spray it so thick that the paint begins to pool or run. Make it the width of the spray fan, running along the piece in one continuous stroke. Remember to spray over the edge as you reach the other side of the piece, to ensure it sticks well to the edges. Moving up to the next 'strip' of paint, make it overlap the previous row about half way into the previous row. If you don't do this, no matter how well you paint each row you'll still end up with a case looking like a zebra. Check our shot to see exactly what we mean by overlapping rows. Practicing this technique on another test surface can help you master this technique. Continue these overlapping rows until the entire piece has been painted. The bay faces and buttons may need only one stroke to be covered in paint. If you find the paint is pooling or beginning to run, hold the can further back from the piece. After letting this coat dry thoroughly, if necessary, apply further coats until every surface is properly covered. A final coat of a clear finish is prudent to prevent scratching. Simply use the exact same type of clear paint that you used for the paint job, and apply a light, even coat to all of the pieces.

Oh crap!

If you do happen to get any blemishes when applying the thicker layers of paint, do not try to wipe the wet paint. As you can see, these end up looking worse than the original small blemish. Things to look out for are bald spots, fish eyes (small white dots in the paint job caused by an unclean surface) and paint runs. Simply let the coat dry thoroughly before lightly sanding back the problem area. Then reapply another layer of paint to cover the blemish.



Looking Good

After one or two thicker coats of paint, you should be done. Remember to let the paint dry thoroughly between each coat! It may take a little longer but it will definitely look better! Let it dry for a full day before rebuilding to stop the paint flaking. Reassemble your case (basically do our disassembly steps in reverse) and you should end up with a case that looks as if it has been painted by DaVinci himself. We also applied an atomic sticker one of our devoted readers had made, and it really was the finishing touch.

And thus ends our 3 part case modding journey. What was once a plain AOpen HX45A beige bore is now the shining icon of beauty that stands before you. And if you think it looks nice here, you'd be amazed at how stunning it looks in a darkened room.

Peripheral painting

So now you've got your PC looking all shiny and schmick, you're probably thinking that you'd like to do the rest of your components in the same colour scheme. Many components are easy to paint while others are best left alone. Painting your keyboard is one of the simpler components to paint. Using a screwdriver, pop each key out of its socket – you might want to draw up a key map so you can remember where each key needs to go come reassembly time. Using Blue Tack, fill the holes that will be revealed underneath each key. Also mask over any labels or LEDs on the keyboard that you don't want to be covered. Using the same techniques described in this article, paint the keyboard in your chosen colour. Leave the keyboard cable unpainted, as the paint will most likely flake with the amount of flexing a cable goes through.

Speakers are also a simple affair to paint. If possible disassemble the speakers, although the process for this is quite specific to each set. Liberal use of masking tape can also protect areas that don't react well to a coating of wet paint. As for monitors, these are best left well alone, due to the difficulty of masking and disassembly. ▢

atomic is a mag, it's a Web site and it's a community. The mag and the site were hand-crafted by skilful artisans. The community, well, that took care of itself. Readers not much different to you found their way to our site like Lemmings to a seaside cliff. Once there, they discovered wonderfully clever news stories as well as our forums.

Witness the value of the site: Once upon a time Person A had a terrible problem with their PC, the answer, unusually, wasn't in atomic magazine, so Person A put up a post on the Tech Talk forum. Within minutes Person B had posted help! Over the following hour Person's C-Z posted contradictory answers, but the point is; there's help out there for you.

Help and community. Come and make friends with other atomic readers, it's a most elite community and you're ever so welcome.

Do please visit, if you haven't already, dear reader. Visit our forums, read what like-minded people are saying to and at each other. Sometimes it's kind, other times hilarious, often it's right down there in the intellectual basement. At all times, though, it's going on.

You are not alone

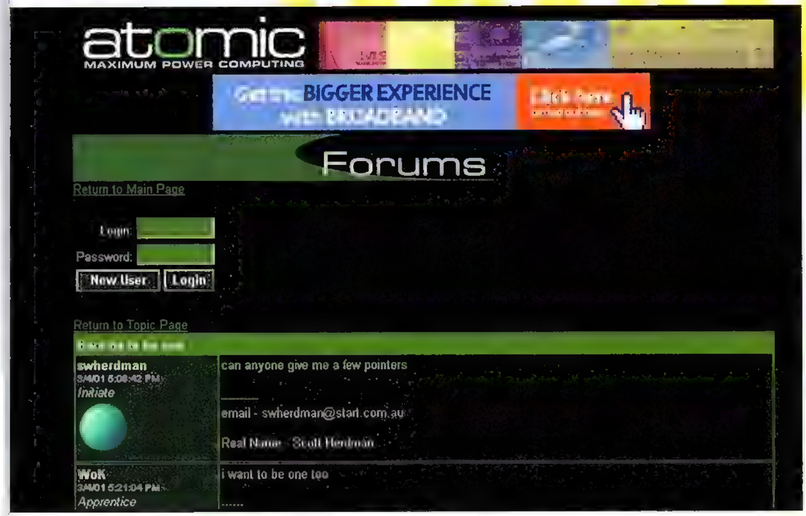
www.atomicmpc.com.

www.atomicmpc.com

www.atomicmpc.com.au

www.atomicmpc.com.au

www.atomicmpc.com.au



swherdman
3/4/01 5:08:42 PM
Initiate

can anyone give me a few pointers

email - swherdman@start.com.au

Real Name - Scott Herdman

WoK
3/4/01 5:21:04 PM
Apprentice

i want to be one too

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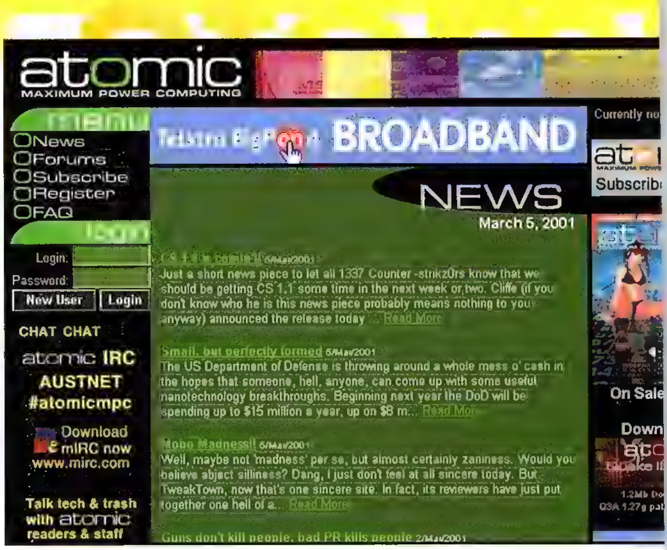


March 5, 2001

Just a short news piece to let all 1337 Counter -strikz0rs know that we should be getting CS 1.1 some time in the next week or two. Cliffe (if you dont know who he is this news piece probably means nothing to you anyway) announced the release today ... Read More

Small, but perfectly formed 5/Mar/2001
The US Department of Defense is throwing around a whole mess o' cash in the hopes that someone, hell, anyone, can come up with some useful nanotechnology breakthroughs. Beginning next year the DoD will be spending up to $15 million a year, up on $8 m... Read More

Mobo Madness!! 5/Mar/2001
Well, maybe not 'madness' per se, but almost certainly zaniness. Would you believe abject silliness? Dang, I just dont feel at all sincere today. But TweakTown, now that's one sincere site. In fact, its reviewers have just put together one hell of a... Read More

Guns don't kill people, bad PR kills people 2/Mar/2001

Belkin Bus Station

Thankfully free of infantile 'catch the bus' puns, this blurb serves to announce a competition where one reader will win the Belkin Bus Station. It's reviewed on page 52, go and have a read. Message ends.

Q: Through which countries did Cliff Richards' bus travels take him in Summer Holiday?

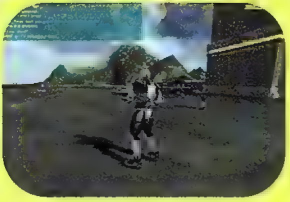
c • o • m • p • e • t • i • t • i • o • n

c • o • m • p • e • t • i • t • i • o • n

Tribes 2

Due to the undeniable fact that this game r0xx0rs, which you will surely know if you read our review on page 64, we have talked the delightful Sonia at Sierra into handing over 5 copies to give to 5 of you. Good eh!

Q: What was Frankie Goes to Hollywood's first Australian Top 10 hit?



c • o • m • p • e • t • i • t • i • o • n

E.N.G.A.G.E.

The lovely Belinda at Acclaim has given us 20 of their E.N.G.A.G.E. game packs to give away. Each pack contains Flying Corp Gold, Apache Havoc, F/A-18 Korea and Fly! All quality flight sims and all yours if you skillfully answer our tough question and are lucky enough to be drawn by Kate the Barrel Girl.

Q: Which fighter pilot, in any conflict, has the highest number of confirmed kills and how many did he score?

c • o • m • p • e • t • i • t • i • o • n

Atomic 3 winners:

Severance Blade of Darkness

Q: What types of sword are used in fencing?

A: Foil, Epee, Sabre

N George, Newnham TAS
E Hart, Neutral Bay NSW
M Brondou, Thornbury VIC
D Andrews, Paddington QLD
K Underwood, Balaklava SA
D Watkins, Narrabeen NSW

Episode 1: Battle for Naboo

Q: What is the name of the military decoration that Han Solo wore in Star Wars Episode's 4, 5 and 6?

A: Correllian Blood Stripe

N Hayne, Sutherland NSW
J Burns, North Rockhampton QLD
K Lee, Oakleigh South VIC
A Doyle, Newtown NSW
J Gabriel, Fairymeadow NSW
T Bucic, Hurstville NSW

Hercules GeForce2 MX

Q: What were the 12 labours of Hercules?

A: The Nemean Lion
The Lernean Hydra
The Arcadian Deer
The Eurymanthian Boar
The Augean Stables
The Stymphalean Birds
The Cretan Bull
The Horse of Diomedes
The Girdle of Hippolyta
The Flock of Geryon
The Apples of Hesperides
The Capture of Cererus

O Omran, Marrickville NSW

Please send all entries to: atomic, Competition name, PO BOX 275, Beaconsfield, NSW 2014 Closing date for receipt of entries is 27/06/01 and announced in atomic 7

post apocalypse

Letter of the Month and Post of the Month each win the Logitech MouseMan Cordless Optical, which is one seriously bitchin' mouse. Sweet.

Exclamation!

I would just like to say how utterly and totally disappointed I am with your new magazine "Atomic Maximum Power Computing".

Let's just start off right there, with the title, just what do you think you are doing! Huh? I want a generic title like 'PC universe' or 'PC's Australia' or a lazy arse abbreviated title like 'AMPC' to have a title that stands out and is printed in big bold words across the top half of the magazine, making easily identifiable... cripes! I want to spend ages looking for my favourite PC mag in a sea of titles, not arrive and pick it out instantly!

Opening up your magazine, which is A4 size... A4 SIZE! PC magazines are supposed to be thick, full of ads and so big they are unpractical! As I was saying, opening up your magazine, which is A4 size, and reading news that hasn't even been posted on some of Australia's most prominent web pages - now that is pure evil!

I reserve the right to be treated as someone who knows next to nothing and wants to read about stuff a month after it has happened! Real News in a News section! SHAME.

Ohhh a 'what's hot' section that makes sense and is actually correct! ARGH! And more up to date news! God help me!

'Hot Box'? Pictures of |337 modded cases! Technical specs! Good pictures! Where are the dark unfocused pictures with one liners and paragraphs waffling about the case!

DDR vs. SDR RAM, an article that compares differing RAM platforms! Such a thing has never been done before! And tests to back up your conclusions!You even concede the fact that DDR-RAM in its current incarnation sux! Why I don't want to hear those harsh words! I want you to treat me like crap and tell me that everything is OK! I want to hear that it'll be alright soon, I should still buy it for the 5-10% and less performance boosts!

A GF2MX card roundup - with benchmarks in 3DMark2000 and Quake 3! Removing HSF's to INVESTIGATE overclocking ability!

Reviews of overclocking, components and joysticks that span a whole page, in small fonts! Many, many PC game reviews! You people disgust me.

An IN-DEPTH case modding GUIDE spanning 7 pages! Where the hell are my one page 'nothing learnt, nothing gained' overclocking and modding articles? Even a step by step section, airflow dynamics, fan placement... I don't know how much more of this I can take! And a back page that is actually funny. You actually expect me to pay a ridiculously low price of $6 for this... this... spawn from computing hell!

I am so never going to subscribe or endeavour to buy every edition of your magazine out for as long as it contains this blasphemy!

I am sorry, but I felt it was my duty to inform you of your gross misconduct in the form of making every other magazine look like toilet paper!

Spikey Alien

0.8 of a Shitload

Street Machine for tech-heads, what a truly marvellous concept!

Loved the article on p71, Issue 1 (PC Guff!). It put me in mind of another niche market, those most detested pariahs of the modern age, and their allocation of firearm calibres. Once the connection was made, the parallels started flying thick and fast. Then I got scared so I went outside for a puff and played with my kitten.

I do, however, take exception to your assertion that I will save one shitload if I subscribe to your magazine. In 1991 the Macquarie University Film Society (Films) standardised the shitload to the value of four (4) wadges. As the saving is only in the order of 3.2 wadges, it is egregious of you to site this value as an entire shitload. How can you expect your readers to have any faith in the accuracy of your technical data when you expect them to subscribe for a saving of only 0.8 shitloads?

Be that as it may, keep up the good work. Death to the Doom-cloud.

Glenwyn Withers

RAM latency

The article on DDR vs SDR in issue three was interesting, but the conclusion is maybe not as surprising as some readers might think - peak speed means very little with RAM. Latency is a MUCH bigger factor.

RAM is read because the cache of the CPU is missed - actually this doesn't happen that often (less than 5 per cent of the time in most cases). However the cost of a miss is huge, and there begins our tale. The cache is organized into blocks and the CPU tries to read a whole block at once – say four 64-bit words (this can vary with CPU and chipset). The chipset will wait a latency time after loading the base address for the line onto the address bus - usually 2 or 3 cycles. Then it will 'burst' for the remaining words in the line, say 3 words. Most RAM is CL3, that is 3 wait cycles at the top speed of the RAM. So assuming a 133MHz bus with SDR CL3 RAM we get 3+1+1+1 =

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Letter of the Month: Chopping Trip

I like playing games, but my computer has trouble running them. I recently upgraded my computer from a Pentium 3 733mini hz, 128mini bytes RAM, TNT1 and modem.

I went to my local computer store and asked what to do. The man said that my computer was fine but I needed a better graphics card. He showed me some cards. A TNT2 which I didn't want because I needed something better than my TNT1, a Voodoo 2 and a Geforce 2. I remember a couple of years ago reading some very good reviews on the Voodoo 2. They said it was the fastest card EVER! So I thought I would buy it.

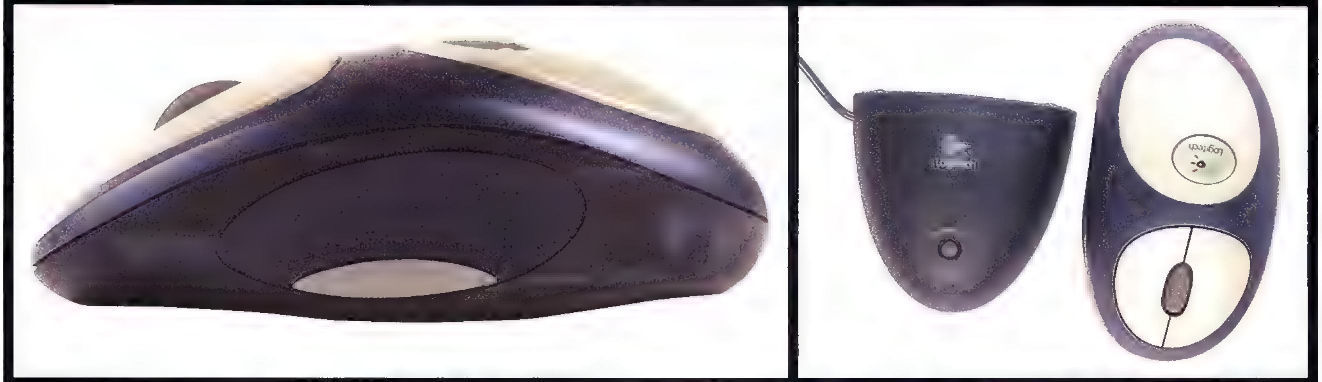
I got home and opened my computer to put the card in, but there was no room to place it. Searching around for something to pull out I found that I had two of the same things. Since I didn't need a spare, I took out something called a PC133 64mb. I then tried to put the card in. But it was broken and wouldn't fit. Angry I took the card back to the store. The man said that the card wasn't broken, but needed to go in a different slot (PCI). He showed me what to do. I went home and pulled out the modem from its slot. I didn't pull out the TNT because I wanted to run it Symmetric Multiprocessing Processing (SMP) with my Voodoo 2, which I read in last months atomic. The Voodoo 2 fitted and I successfully started the computer and installed the drivers. But when I tried to connect to the Internet, the computer said: "Cannot find modem", even though my modem was sitting right on top of it! Does the Voodoo 2 conflict with modems? The man at the computer store claimed it didn't, but the modem was working before I installed the Voodoo 2, also my computer now reports only 64 mini bytes of RAM. Despite upgrading my computer, I still die all the time when playing Counter-Strike. I don't think the guns shoot straight. What should I do?

P.S. I don't think the man in the store knew much about computers.

P.P.S If I want to add a second processor, possibly a DAM Duron (Atomic Issue 1), will I be able to put it in the slot where the spare PC133 64 mb was?

[AsSaSs1nz] KilL3rSn1p3R

Oh my god it's the funny shit. We fed this letter into atomic 1, our self-aware AXIA and it spake "he's kidding".



Forum Post of the Month: A Quantative Measure: Do Graphics Count?

Graphics, memorialised as the feature that can make or break a game have undergone major revamps in recent times. Foremost, the mainstream adoption of the 3D accelerator and the following iterations have certainly defined an age of gaming. Although, with all new features introduced there are a horde of games cashing in on the graphics but lacking any real substance. Games that merely exist to showcase the new potential rather than introduce anything new.

Relate this to the next feature to revolutionise graphics: The GeForce 3. The inclusion of a programmable GPU will certainly impact on game design, but will the quality still be evident? It is unfortunate that while there are many great games released that do fully utilise this technology, there are hundreds of other lacking and uninspiring releases. From a strictly gaming point of view, it always seems to be those games that improve gameplay not graphics that succeed. Consider classics such as System Shock, Thief, Half-Life. All games that revolutionised gameplay not graphics.

While the GF3 may herald some truly terrific graphics that redefine all previous standards, I certainly won't buy one merely to play games. Some of the greatest games spring not through graphics but through innovative design and gameplay. So in a technological sense, whilst we steam ahead through quality graphics, it is, and has always been the gameplay that shapes the games we play. Let's put less emphasis on graphics developers and actually use the graphics to facilitate some purpose. It is a challenge, but one that the developers of today can tackle. Good Luck.

Zainny

http://www.atomicmpc.com.au/forum.asp?cat=ge&top=2979

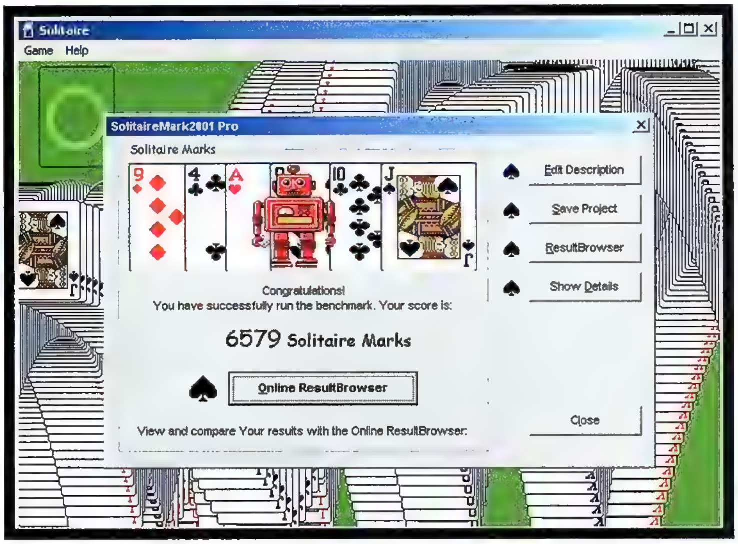
Another gem from the Hero Zainny. This man is an unstoppable golden post machine, superb Zainny.

6 cycles per cache read. Assuming a 133MHz bus with DDR CL3 RAM we get 3+0.5+0.5+0.5 = 4.5 cycles per cache read. So at best this DDR RAM is 33 per cent faster than SDR RAM, and not twice as fast.

CL2 is REALLY important with DDR RAM, because 2+1+1+1 = 5 cycles, while 2+0.5+0.5+0.5 = 3.5 cycles. DDR RAM is now 43 per cent faster. Note that DDR RAM benefits even more than SDR does from CL2. To make matters worse, most chipsets are conservative in the latency they allow, which often wastes potential gains of higher spec RAM, like PC150. Basically, all that PC2100 stuff is complete rubbish – don't believe the hype! Spend your money on low latency RAM, not DDR. My overclocked Celeron runs CL2 and it makes a huge difference. The real aim of RAM manufacturers and chipset vendors should be CL1 – that would make more difference than DDR CL3 (4 vs. 4.5). This is also why RDRAM blows - its latency is huge (it is fast, but addresses need many bus cycles to load due to 16-bit bus) so unless the cache blocks are HUGE there is little benefit from it.

Jeremy Kelaher

>



Congratulations!
You have successfully run the benchmark. Your score is:

6579 Solitaire Marks

View and compare Your results with the Online ResultBrowser:

ⓘ At atomic we believe in only using the best, cutting edge graphics based benchmarks. This is why we use SolitareMark for all our desktop needs.

Tim Dean replies: There can be no doubt that latency is a vital statistic in RAM. What you mention about transfers of four words is true, and in some instances DDR can even be slower than CL2 PC133 SDRAM over short transfers. With larger burst lengths, such as with eight-word transfers, then DDR can take more of a lead, and can begin to reach its true potential of twice the speed of PC133. Older SDRAM-only chipsets are usually set to only four-word transfers, although chipsets like the AMD 760 take this into account, and specifically set transfers to eight words where possible. And finally, I agree, CL1 RAM would definitely make my day.

SolitaireMark2001

Great mag. They say a picture tells a thousand words but here are just a few. I thought you gurus at atomic were into testing with the latest software but why is John Gillooly playing solitaire (page 6 issue 2 bottom right) with Ashok Zaman timing him? By the way what is the quickest time in which John has completed solitaire?

Sorry to pick on John but where did he get the Hawaii five O shirt from? From the picture aren't Bennett Ring and the editor old enough to grow facial hair like the rest of the A team?

Do you pay Ashok enough because he is the only one who can't afford a watch? Keep up the great work (wish I had your job).

Paul Morse.

Thanks. That there was SolitaireMark2001, it's how we test new cards because it just seems right. John doesn't know how to play Solitaire, so we told Bennett is was a new version of CounterStrike and he's now the main SolitaireMark2001 tester, athough he sucks at it. Ashok doesn't believe in the concept of 'time', he's more a 'space' kinda guy.

Wulf Pack

I liked the articles about the AMD Beowulf cluster and symmetric multi-processing. I think I have a solution that would allow a network to function as a cluster and as a 'variable' SMP system.

My solution is to have a small, program that can intercept commands to be moved across the network to exploit idle CPU and memory. For example, on most machines there are heaps of programs that live in the system tray and that automatically load on start, using up system resources. If they could be shuffled across the network to idle machines, it opens up greater performance for the head node. Secondly when playing a game and the action halts for lack of memory resources, the program could intercept the commands and use the other machines' memory to speed up the action, it would sure beat thrashing the hard disk.

Thirdly when operating multiple programs, each program could be shuffled off to the other machines in the network. Say that you are searching for something on the Internet, composing an e-mail, playing your favourite MP3s and (assuming you are actually working) crunching your tax numbers, or burning that new CD, all at the same time, the system would send different working programs to the other nodes in the network with no slow down.

The program of course would have to allow the network function as a normal network as well, but it need only be a network control program to make all this work. It seems that there are other programs that allow basically the same or similar functions but for stand alone machines, so it shouldn't be impossible to implement. I can already imagine the check boxes and settings for the network. Of course it would also have to be able to remotely shut down other machines from the head node.

Alan Wilkinson

Tim Dean replies: You raise some interesting points. Parallel and distributed network processing is an excellent idea, and can certainly increase the performance of some applications, although there are a few factors to consider with your particular examples. It all really depends on the type of application, and the bottlenecks that occur when running those programs. For applications that require a great deal of simple processing power, such as with running the molecular combinations in the Caduceus cluster from last issue, distributed processing is ideal since you can run the calculations and compile the results down the track. SETI@HOME is another good example of distributed processing except instead of just using a normal network, it passes each data packet to be worked on via the Internet. For things such as games and small applications, or anything where you need an immediate response, distributed processing is not as good. The bottleneck in this case becomes the network and I/O. Even with a 100Mbit network data is only transferred at 12.5MB/sec, compared to the 1,064MB/sec of simple PC133 SDRAM. This means that if there is a significant amount of data involved with the application, then it takes ages for it to get from machine to machine, which slows the whole processes down. Your idea would be great, however, on large networks where large amounts of processing are needed, like a Gigabit Ethernet network with semi-thin clients that can all contribute to the overall load sharing. ▢

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The goods stashed in the atomic Warehouse represent quality, no doubt there. Quantity though, is what's really in abundance. There's everything here. Everything computery, at least. We bundled all these informative, encyclopaedic adverts in one bunch up the back, so you, with but a quick flick of the wrist, can come out on top.

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LG 77M MultiMedia Studioworks 17"	$623
NEC V721 17" Monitor 1280x1024, 0.28	$445
NEC V921 19" Monitor 1600x1200	$796
NEC E1100 21" Monitor 1600x1200	$1,781
NEC P1250+ 21" Monitor 1800x1440, 0.25	$1,956
Sony E220 17", .24-.25 (Flat Trinitron)	$721
Sony G420 19", .24-.25 (Flat Trinitron)	$1,234
Sony G520 21", .24 (Flat Trinitron)	$2,063
Viewmaster M17E 17", .27 1280x1024	$389
Viewmaster M19E 19", .25 1600x1200	$640
Viewsonic PS775-2E 17", .26 1600x1200	$583
Viewsonic PF775 17", .25 1600x1200 Flat	$700
Viewsonic E70 17", .27 1280x1024	$382
Viewsonic M70 17", .27 1280x1024 MM	$451
Viewsonic E790 19", .26 1600x1280	$825
Viewsonic PF790 19", .25 1600x1200	$941
Viewsonic G810-4E 21", .25 1800x1440	$1,511
Viewsonic P815-4 21", .25 1800x1440	$1,805

LCD MONITORS

Acer FP450 14" LCD	$1,047
Acer FP558 15" LCD (Speaker + USB)	$1,626
Acer FP751 17" LCD (Speaker + USB)	$3,560
Acer FP855 18" LCD	$5,564
Hitachi CML151XW 15" TFT Monitor	$1,515
Hitachi CML170SXW 17" TFT Monitor	$2,846
Xenon 15" active TFT	$1,170
LG 15" SW570LS LCD Monitor	$1,724
LG 18" W880LC LCD Monitor	$6,138
Keycorp 12.1" DSTN Monitor	$899
Keycorp 12.1" TFT Monitor	$1,269
Keycorp 15.1" TFT Monitor	$1,786
Keycorp 18.1" TFT Monitor	$5,532
Mitsubishi TFT 15" DV150 1024x768	$1,821
Mitsubishi TFT 18" RDT180S 1280x1024	$5,291
NEC 15" LCD 1510V+ M'n'tr 1024 x 768	$2,417
NEC 15" LCD 1525V Monitor 1024 x 768	$2,072
NEC 15" LCD 1525M M'n'tr 1024 x 768, MltiMdia	$2,283
NEC 18" LCD 1810 Monitor 1280 x 1024	$6,159
NEC 20" LCD 2010X Monitor 1280 x 1024	$9,509
Panasonic 15" LC50S LCD 0.25+USB+Speakers	$1,969
Panasonic 19" LC90S LCD 0.25+USB+Speakers	$7,248
Sony 15" SDMM51 TFT Monitor	$2,308
Sony 15" SDMN50 TFT Monitor	$2,937
Sony 18" CPDL181 TFT Monitor	$6,032
Viewsonic 15" LCD VE150 1024x768	$1,663
Viewsonic 15" LCD VP151 1280x1024	$3,080
Viewsonic 18" LCD VP181 1600x1200	$6,074

PROJECTORS

Viewsonic PJ820 SVGA Projector	$7,142
Viewsonic PJL855 SVGA Projector	$6,333
Viewsonic PJ860 SVGA Projector	$8,527
Viewsonic PJL1035 XGA Projector	$8,527
Hitachi CPS220 SVGA 800x600 Projector 800lum	$5,355
Hitachi CPS840 SVGA 800x600 Projector 900lum	$5,643
Hitachi CPX940 XGA 1024x768 Projector 1000lum	$7,838
Hitachi CPS860 SVGA 800x600 Projector 1700lum	$8,276
Sony CPJ-D500 SVGA Projector 640x480	$3,086
Sony Ultra Compact LCD Projector	$5,653

CASINGS

Deluxe Midi Tower ATX 250W	$61
AOpen Midi Tower ATX KF45	$89
AOpen Desktop ATX HX95	$131
AOpen Full Tower ATX HX08	$202
Intel Chenbro Chassis for Pentium 4	$303
Macase Midi Tower ATX KA-80 250W	$128
Macase Midi Tower ATX KA-80 300W	$142
Macase Midi Tower ATX KA-580WP 250W	$131
Macase Midi Tower ATX KA-580WP 300W	$149
Macase Desktop ATX	$125
Macase Full Tower ATX KA-C-80 FAN DUST 300W	$259
Macase Server Tower ATX KAO66 (2X300W)	$1,084
Macase Server Tower ATX KAO66 (1X300W)	$481
Macase Server Tower ATX KAO66 (1X400W)	$701
Macase KI-P20 2U Rackmount ATX Case 300W	$578
Macase 8-Bay Ext. SCSI -50 CDROM tower	$572
Macase 14-Bay Ext. SCSI -50 CDROM tower	$935
Macase KA-036 File Server ATX Cabinet 2x300W	$1,409
Macase KI-P50 5U Rackmount ATX Case 2x300W	$1,939
750 SuperO 300W Slot1/2 Server Chassis	$497
760 SuperO 300W Slot1/2 Server Chassis	$593
760 SuperO 400W Slot1/2 Server Chassis	$617
801 SuperO Deluxe Dual PIII/Xeon Chassis	$987
830 SuperO Deluxe Dual PIII/Xeon Chassis	$1,456
850 SuperO Deluxe Quad PIII/Xeon Chassis	$3,970
860 19" SuperO Rackmount Dual PIII/Xeon	$2,242
860 19" SuperO Rackmount Quad PIII/Xeon	$3,056
5.25" External Case for IDE - Parallel Port	$126
5.25" External Case for IDE - USB	$172
5.25" External Case for SCSI-50	$136
3.5" External Case for SCSI-68	$151
2-Bay 5.25" Ext Case for SCSI-50	$186
2-Bay 5.25" Ext Case for SCSI-68	$234
2-Bay 5.25" Ext Case for SCSI-LVD68	$289
250W ATX Power Supply	$44
300W ATX Power Supply	$80

KEYBOARDS

Deluxe 104 - Keyboard PS/2	$15
Acer Accufeel Keyboard PS/2	$23
Honeywell Euroboard M-Media Din-5&PS/2	$65
Fujitsu Internet Keyboard PS/2	$37
KeyTronic Designer Keyboard PS/2 (Black)	$45
Logitech Internet Keyboard PS/2 (oem)	$50
Logitech Cordless iTouch	$128
Logitech iTouch Keyboard w/ 2 USB Ports	$108
Logitech C'less Keyboard + Mouse (oem)	$131
Logitech C'less Freedom Pro (K/b + Mouse) (oem)	$220
Microsoft Internet Keyboard PS/2 (oem)	$49
Microsoft Internet Keyboard Pro (oem)	$67
Microsoft Ergonomic Elite PS/2	$63
Microsoft Natural Keyboard Pro PS/2&USB	$115

MICE

A4+ 400dpi 2-Button PS/2	$8
A4+ 400dpi 2-Button Serial	$7
Browser Wheel Mouse PS/2	$15
Swann Mini Mouse (Blueberry) USB	$14
Logitech Wheel Mouse PS/2 (oem)	$42
Logitech Wheel Mouse USB (oem)	$40
Logitech WingMan Gaming Mouse	$100
Logitech Cordless Wheel Mouse PS/2 (oem)	$80
Logitech Cordless MouseMan Wheel PS/2	$108
Microsoft 2-Button Mouse PS/2 (oem)	$18
Microsoft Trekker Mouse PS/2 (oem)	$17
Microsoft Intellimouse PS/2 (oem)	$44
Microsoft Intellimouse Optical USB&PS/2 (Retail)	$81
Microsoft Intellimouse Explorer USB&PS/2 (oem)	$74
Logitech Trackman Marble Wheel USB&PS/2	$97
Logitech Trackman Marble FX Serial&PS/2	$150
Logitech Cordless TrackMan Wheel USB&PS/2	$136
Logitech Cordless TrackMan FX USB&PS/2	$182
Logitech Cordless TrackMan Live	$314

JOYSTICKS

Logitech WingMan GamePad Extreme	$108
Logitech WingMan Extreme Digital 3D	$99
Logitech WingMan Force 3D USB	$127
Logitech WingMan Strike Force 3D USB	$186
Logitech WingMan Force USB	$204
Logitech WingMan Formula GP	$129
Logitech WingMan Formula Force GP	$227
Microsoft Sidewinder GamePad Pro USB	$76
Microsoft Sidewinder Dual Strike 1 USB	$88
Microsoft Sidewinder Precision Pro	$90
Microsoft Sidewinder Freestyle Pro G&USB	$129
Microsoft Sidewinder Force Feedback + Game	$248
Microsoft Sidewinder Racing Wheel USB	$111
Microsoft Sidewinder Force Feedback Wheel	$274

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44x IDE ATAPI CD-ROM Drive	$67
52x BTC IDE CD-ROM Drive	$80
52x Creative IDE CD-ROM Drive	$80
50x Asus IDE CD-ROM Drive	$83
52x LG IDE CD-ROM Drive	$70
40x Plextor SCSI (20MB/s) CD-ROM Drv 50pin HD	$304
32x Teac SCSI CD-ROM Drive	$164
24x Teac PCMCIA External (Notebook)	$319

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Pioneer 16x DVD 40xR IDE Bare Drive (OEM) (#116)	$175
Pioneer 10x DVD 40xR SCSI Bare Drive (Rtl)	$335
Creative Encore Kit 12x DVD + MPEG Card (Rtl)	$477
Creative DXR3 MPEG II DVD Card (OEM)	$293
Vlogic Decorder Card	$293
Panasonic 16X DVD IDE Bare Drive (OEM)	$191

CD REWRITERS

Plextor (16x10x40) IDE + Soft + Media	$745
Plextor (12x10x32) SCSI + Soft + Media	$769
HP 9140i (8x4x32) IDE	$329
HP 9350i (10x4x32) IDE	$463
HP 9500i (12x8x32) IDE	$556
HP 9600si (12x8x32) SCSI	$710
HP 8230e (4x4x6) Ext USB	$534
HP 9600se (12x8x32) Ext SCSI	$890
Acer (10x4x32) IDE + Soft + Media	$299
Acer (4x4x6) Ext USB	$451
Ricoh 7125A (12x10x32) IDE Kit	$387
Ricoh 8040S (4X4X20) SCSI Slim (Notebook)	$746
Ricoh 9060A (6x4x24x4) IDE DVD-CDRW	$488
Ricoh 9120A (12x10x32x8) IDE DVD-CDRW	$588
Creative 121032 with Burn Proof (Retail)	$396
Sony 160S (12x8x32) SCSI Bare Drive (OEM)	$434
Sony 160E (12x8x32) IDE Bare Drive (OEM)	$351
Panasonic (8x4x32) IDE + Soft (OEM)	$349
Iomega Zip (12x10x32) Int IDE	$561
Iomega Zip (4x4x6) Ext USB	$455
Yamaha (8x4x24) SCSI Bare Drive (OEM)	$391
Yamaha (8x4x24) SCSI + Soft + Media	$439
Yamaha (16x10x40) SCSI + Soft + Media	$596
Yamaha (8x8x24) Ext SCSI + Soft + Media	$571
Yamaha (8x8x24) Ext Firewire + Soft + Media	$690
Adaptec EZCD Creator (OEM)	$62
Adaptec Toast V3.5.2 (Macintosh)	$176
Dvision Blank CD-R Pack (25 Pieces) 650Mb	$23
Dvision Blank CD-R Pack (25 Pieces) 700Mb	$25
Ricoh Blank CD-R 74min	$2
Laser Blank CD-R 80min	$1
Blank CD-RW Laser	$4
75 MIN VERBATIM Blank CD	$1

SOUND CARDS

Eagle 16 bit ESS 1938	$27
Sound Blaster Vibra 128 (oem)	$46
Sound Blaster PCI-128 2-Channel (oem)	$55
Sound Blaster LIVE (oem)	$112
Sound Blaster LIVE DE 5.1	$189
Sound Blaster LIVE Platinum 5.1	$449
GUILLEMOT MAXI SOUNDMUSE (Retail)	$75
Diamond Monster Sound MX400 (oem)	$110
Guillemot Maxi Fortissimo	$82
Guillemot Maxi Studio ISIS XL	$700

SPEAKERS

180W PMPO Stereo Power	$15
Zodiac Subwoofer Premium Stereo Speakers	$45
Altec Lansing ACS22 - 2p	$45
Altec Lansing ACS233 - 3p	$79
Altec Lansing ACS45.1 Power Cube - 3p	$165
Altec Lansing ATP3 Flatpanel -3p (multi-channel)	$207
Altec Lansing ACS56 Gamers -5p Digital in	$265
Altec Lansing ACS48 Power Cube + - 3p	$265
Altec Lansing ADA305 USB Dolby P/L Srnd	$225
Altec Lansing ADA880 Dolby AC3 - 5p	$488
Creative Speaker Stand (Creative Surround Station)	$149
Cambridge PCWorks 3-p	$78
Cambridge FPS1000 4-p Surround	$152
Cambridge FPS1500 4-p Surround Digital	$185
Cambridge FPS2000 4-p Surround Digital	$375
Cambridge DTT2500D 6-p Desktop Theater	$620
Cambridge DTT3500D 6-p Desktop Theater	$779
Logitech SoundMan S-20	$108
Logitech SoundMan SR-30	$180
Logitech SoundMan Xtrusio DSR-100	$383
Yamaha YST/20 Digital Surround Speakers	$116
Yamaha YST/M100 Surround Speakers	$210
Yamaha YST/MS30 Subwoofer + Speakers	$125
Yamaha YST/MS55 Sub + Speakers USB	$263
Yamaha YST/MSW8 Subwoofer	$104

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MS Windows 98 Second Edition on CD (oem)	$214
MS Windows ME on CD (oem)	$207
MS Windows 2000 PRO (oem)	$314
MS Windows 2000 Server + 5 User (oem)	$1,611
Microsoft NT Workstation 4.0 (oem)	$330
Microsoft NT Server 4.0 + 5 User (oem)	$1,275
Microsoft NT Server 4.0 + 5 User	$1,673
Microsoft NT Server CAL	$73
Microsoft B'Office SBS 4.5 + 5 Users (oem)	$2,515
Microsoft B'Office SBS 5 Users Licence	$484
Microsoft OFFICE 2000 S.B.E. (oem)	$401
Microsoft OFFICE 2000 PRO (oem)	$512
Microsoft OFFICE 2000 Standard Full Version	$957
Microsoft OFFICE SBE 2000 Full Version	$957
Microsoft OFFICE PRO 2000 Full Version	$1,148
Microsoft OFFICE Premium 2000 Full Version	$1,532
Microsoft Works Suite 2001 (oem)	$129
Microsoft Publisher 2000	$199
Adobe Photoshop 6.0 98/NT/ME	$1,366
Corel Draw 9 Full Version	$1,101
Corel Draw 10 Full Version	$1,188
Lotus Millenium Smart Suite for Windows	$49
M.Y.O.B. First Accounts	$187
M.Y.O.B. Asset Manager	$282
M.Y.O.B. Accounting	$375
M.Y.O.B. Accounting Plus (Payroll)	$539
M.Y.O.B. Premier Accounting	$997
M.Y.O.B. PowerPay	$470
M.Y.O.B. Digi-Till for Windows	$997
Symantec Norton Utilities 2000	$113
Symantec Norton Antivirus 2001 (oem) (sym170)	$92
Symantec PC Anywhere Ver. 9.0	$236
Symantec WinFax Pro Ver. 10.0	$117
Symantec Norton Antivirus Enterprise Licence	$122
Symantec Norton Antivirus Enterprise (Media)	$41

PRINTERS

Acer Fotoprisa 300P	$314
Brother HL-1240 12ppm 2M Laser	$514
Brother HL-1250 12ppm 4M Laser	$640
Brother HL-1270N 12ppm 4M Laser	$890
Brother HL-1650 16ppm 8M Laser	$1,116
Brother HL-1660e 16ppm 8M Laser	$1,660
Brother HL-2060e 20ppm 8M Laser	$1,951
Brother MP-21C Portable InkJet Printer	$533
Brother MFC-970MC All-in-One Colour InkJet	$520
Brother MFC-7160C All-in-One Colour InkJet	$923
Brother MFC-9100C All-in-One Colour InkJet	$1,336
Brother MFC-4340 Fax/Printer/Copier Laser	$1,068
Brother MFC-8600 All-in-One Laser	$1,515
Samsung ML-4500 8ppm 600dpi	$431
Samsung ML-5200A 10ppm 1200dpi (+USB)	$602
Samsung ML-6060 12ppm 1200dpi	$928
Samsung ML-7050 17ppm	$1,437
Canon BJC-55 Portable (opt. Scanner)	$627
Canon BJC-85 Portable	$345
Canon BJC-1000SP	$108
Canon BJC-2100SP 5ppm	$145
Canon BJC-3000 (+USB)	$203
Canon S400	$216
Canon S800	$653
Canon BJC-4650 (A3) (opt. Scanner)	$393
Canon BJC-6200 8ppm (1440x720)	$344
Canon BJC-6500 8ppm (1440x720) (A3)	$596
Canon BJC-8200	$557
Canon BJC-5500 (A2)	$1,167
Scanner head for 50/85, 4300/4650 #IS22	$90
Canon LBP800W 8ppm	$515
Canon LBP1000 Laser	$1,147
Canon LBP1760 17ppm (1200x1200)	$1,620
Canon B-155 Bubble Jet Fax	$404
Canon MPC-70 Multifunction Photo BJ 4 in 1	$499
Canon MPL-60 Multifunction Laser 4 in 1	$1,205
Epson Stylus Color 480 (720x720)	$137
Epson Stylus Color 580 (1440x720) (USB)	$162
Epson Stylus Color 680 (2880x720) (+USB)	$262
Epson Stylus Color 880 (2880x720) (+USB)	$430
Epson Stylus Color 900 (2880x720) (+USB)	$633
Epson Stylus Color 980 (2880x720) (+USB)	$700
Epson Stylus Color 1160 (A3+)	$781
Epson Stylus Color 3000 (A2)	$2,052
Epson Stylus Photo 720 (1440x720) (USB)	$320
Epson Stylus Photo 1290 (A3+)	$986
Epson Stylus Photo 2000P (A3+)	$1,797
Epson FX880 9P D/M 455cps 80c	$712
Epson FX980 9P D/M 563cps 80c (S/P)	$777
Epson FX1180 9P D/M 410cps 136c	$850
Epson FX2180 9P D/M 500cps 136c	$966
Epson LQ300 24P D/M 240cps 80c (S/P)	$346
Epson LQ570+ 24P D/M 269cps 80c	$564
Epson LQ670 24P D/M 300cps 80c	$671
Epson LQ870 24P D/M 330cps 80c	$834
Epson LQ2080 24P D/M 400cps 136c	$727
Epson LQ2180 24P D/M 480cps 136c	$1,198
Epson DLQ3000	$1,685
Epson DFX5000+ 9P H/S 560cps 136c (S/P)	$3,198
Epson DFX8000	$4,703
Epson EPL-5700L	$635
Epson EPL-5800	$874
Epson EPL-N1600 16ppm	$1,496
Epson EPL-N2050	$2,358
Epson EPL-N2000 20ppm (A3) (N/W)	$3,037
Lexmark Z11 Colour (1200x1200)	$132
Lexmark Z31 Colour (1200x1200)	$162
Lexmark Z32 Colour (1200x1200)	$186
Lexmark Z42 Colour (1200x1200)	$279
Lexmark Z52 Colour (1200x1200)	$408
HP DeskJet 350CBI (Portable)	$540
HP DeskJet 640C	$178
HP DeskJet 840C	$224
HP DeskJet 930C	$270
HP DeskJet 950C	$439
HP DeskJet 970Cxi	$708
HP DeskJet 1125C (A3)	$583
HP DeskJet 1220C (A3)	$860
HP DeskJet 2000C	$844
HP DeskJet 2000CN	$1,501
HP DeskJet 2500C	$1,928
HP DeskJet 2500CM	$2,797
HP OfficeJet 725 4 in 1	$548
HP OfficeJet R65 4 in 1	$910
HP OfficeJet T45 4 in 1	$641
HP OfficeJet T65 4 in 1	$733
HP OfficeJet G55 All in 1	$934
HP OfficeJet G85 All in 1	$1,143
HP OfficeJet G95 All in 1	$1,515
HP OfficeLaser 3150 4 in 1	$1,156
HP LaserJet 6L Pro	$610
HP LaserJet 1100 8ppm	$708
HP LaserJet 1100A 8ppm (Scanner)	$878
HP 1100 Scanner / Copier Add-on	$318
HP LaserJet 2200	$1,577
HP LaserJet 4050	$2,094
HP LaserJet Colour 4100	$2,156
HP LaserJet 5000 A3	$2,806
Kyocera FS-1000	$594
Kyocera FS-1200	$1,046
Kyocera FS-1750	$1,595
Kyocera FS-3750	$1,995
Kyocera FS-5900C	$4,080
Kyocera FS-7000+	$3,891
Kyocera FS-9000	$4,988
Panasonic KX-P6100	$308
Xerox DocuPrint P8ex 8ppm	$415
16MB Memory Upgrade for P8ex	$99
Xerox DocuPrint P1210 12ppm	$703
Xerox WorkCentre 385 4-in-1 Laser	$986
OKI OKIPAGE 8IM (Blueberry)	$432

SCANNERS

Acer 620S SCSI (600x1200)	$161
Acer 640U USB (600x1200)	$126
Acer 620ST SCSI (600x1200) (Trans)	$290
Acer ScanPremio ST (1200x2400)	$1,336
Acer ScanWit 2720S Film Scanner	$621
Agfa Snapscan E20 USB (600x1200)	$213
Agfa Snapscan E40 USB (1200x2400)	$345
Agfa Snapscan E50 + 35mm Film (1200x2400)	$416
Agfa Snapscan Touch Desktop USB (600x1200)	$247
Agfa Duoscan T1200 SCSI (600x1200)	$1,300
Agfa Duoscan HiD SCSI (1000X2000)	$3,825
Agfa Duoscan T2500 SCSI (2500X1250)	$8,653
Mitsubishi DV648U USB (600X1200)	$102
Mitsubishi DV648UT USB + TPO (600X1200)	$219
Mitsubishi DV1248ST SCSI +TPO (1200X2400)	$978
Umax Astra 2100U 36-Bit (600x1200)	$113
Canon CanoScan N340P (300x600)	$113
Canon CanoScan N640P (600x1200)	$138
Canon CanoScan N650U USB (600x1200)	$179
Canon CanoScan N660U USB (600x1200)	$285
Canon CanoScan N1220U USB (1200x2400)	$275
Canon CanoScan FB1230U USB (1200x2400)	$441
Epson Perfection 640 USB (600x2400)	$280
Epson Perfection 1200 USB (1200x2400)	$458
Epson Perfection 1240 USB (1200x2400)	$451
Epson Expression SCSI & USB (1600x3200)	$1,641
Epson GT-7000 USB (600x1200)	$386
Fujitsu 3091 DC	$1,241
Fujitsu ScanPartner 600C	$2,608
Fujitsu 3093 DG	$7,298
HP ScanJet 3300C USB	$192
HP ScanJet 3400C USB	$276
HP ScanJet 5300C USB	$367
HP ScanJet 5370C USB	$588
HP ScanJet 6300C USB (1200dpi)	$702
HP ScanJet 6350C (ADF)	$884
HP ScanJet 6390C (ADF, + Trans)	$1,339
HP PhotoSmart S20	$840
Plustek OpticPro 1248U (600x1200) USB	$113
Plustek OpticPro U12B (600x1200) USB	$122
Microtek Scanmaker 4 SCSI (Trans)	$1,279
Microtek ScanMaker 8700 (1200x2400) USB&FW	$2,057
Microtek Artix 4000	$2,277
Microtek Scanmaker 9600XL A3	$3,085

MODEMS

56K V90 Fax Modem Internal (oem)	$39
56K V90 Fax Modem Internal Web Excel	$49
56K V90 Fax Modem Ext. Topline Dynalink	$97
Netcomm Roadster II 56K V90 Ext. (oem)	$181
Netcomm Roadster II 56K V90 Ext. USB (oem)	$187
Netcomm Smart i-Share 56 #SM4200	$478
Netcomm SmartModem 56 V90 Ext.	$483
Netcomm Mega I-Modem External	$137
3Com USR FaxModem 56K Ext.	$224
3Com USR Voice Message Modem 56K Ext.	$268
3Com USR Professional Message 56K Ext.	$326
Paradise Wavecom 56K Pro	$180
Swann Speed Demon Internal Modem	$58
Swann Smart II 56k Internal Modem	$65
Swann Speed Demon External Modem	$112
Swann Turbo 56K External Modem	$150
Swann Smart II External Modem	$185
Dynalink ALE070 USB ADSL Modem	$389

PCMCIA (MODEM)

Lightspeed 56K Rockwell PCMCIA Modem	$128
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Umax AstraCam 640x480 4MB USB	$274
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Canon PowerShot A50	$1,068
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Canon PowerShot S10	$1,254
Canon PowerShot S20	$1,647
HP PhotoSmart S20	$846
HP PhotoSmart C200	$635
HP PhotoSmart C500	$1,176
Epson Photo PC700 1280x960 + 1 4Mb	$1,003
Kodak EZ-200	$250
Kodak DC-3200	$493
Kodak DC-3400	$772
Kodak DC-3800	$784
Kodak DC-5000	$1,189
Kodak DC-4800	$1,518
Sony Mavica MVCFD85 Digital Camera	$1,398
Sony Mavica MVCFD90 Digital Camera	$1,580
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Sony Mavica MVCCD1000 Digital Camera	$2,558
Sony Cybershot DSCS30 Digital Camera	$1,088
Sony Cybershot DSCS70 Digital Camera	$1,881
Sony Mavicap Camera Device for TV/Camcorder	$1,035

MP3 PLAYERS

Diamond Rio 500 64MB	$428
Nomad II MG 64MB + Docking Station	$705
Nomad II Docking Station	$58
Creative Labs MP3 Jukebox	$927
Hip Zip MP3 Player	$556

TV TUNERS

Dynalink TV Tuner PCI	$109
Dynalink TV Tuner PCI + FM Radio	$128
Hauppauge WinTV GO PCI	$164
Hauppauge WinTV GO FM PCI	$197
Hauppauge WinTV USB	$251
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Miro Media PCTV PRO	$374
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Averkey Pro PC-TV Converter 800x600	$303
Averkey 300 PC-TV Converter XGA + Remote Pointer	$440
Averkey 500 PC-TV Converter + Remote Pointer	$633

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Creative VB WebCam 3 USB	$147
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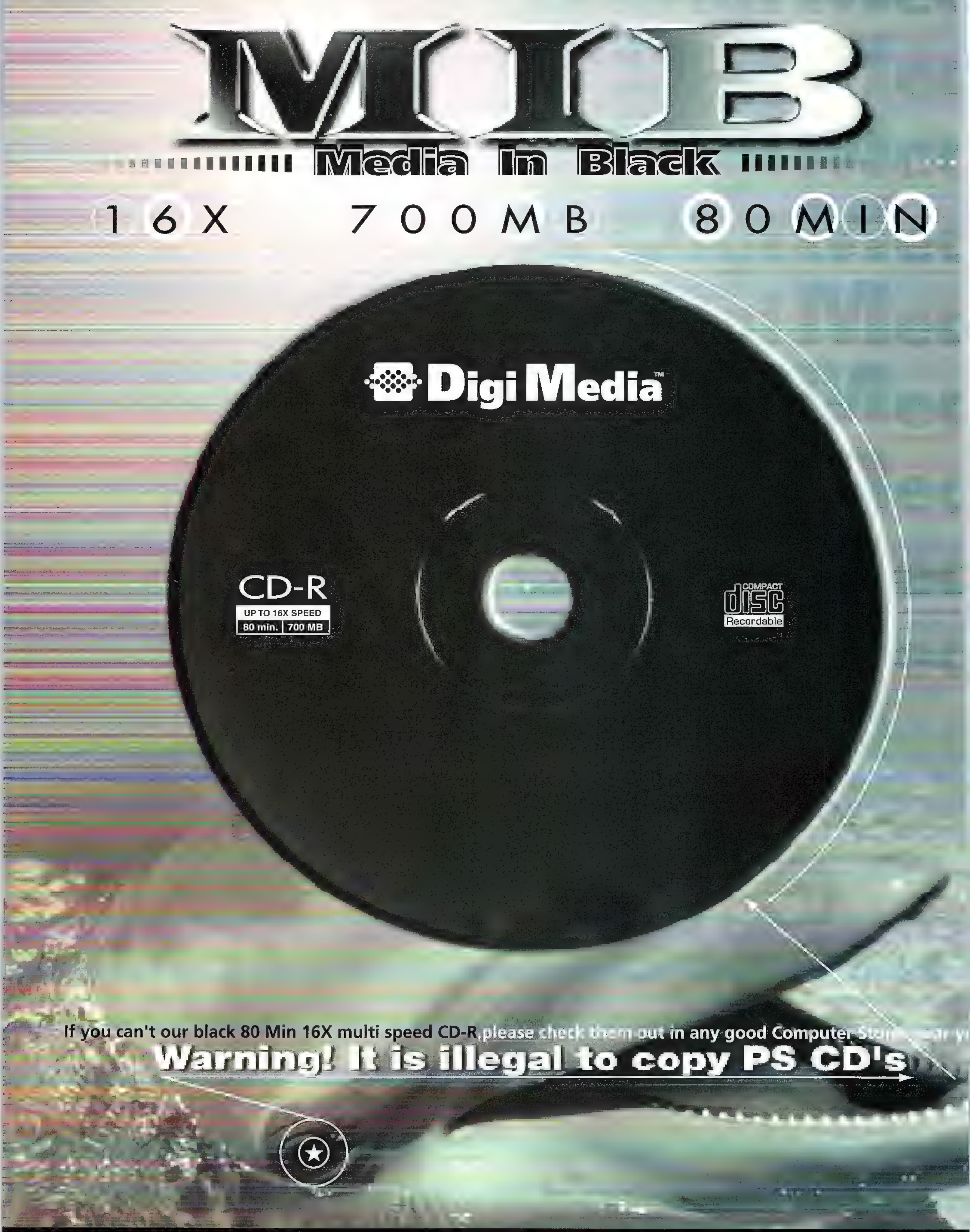

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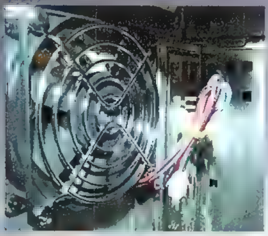
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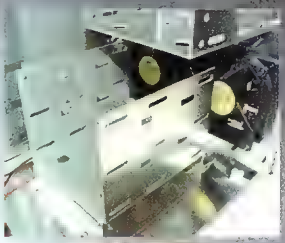
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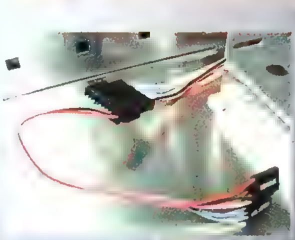
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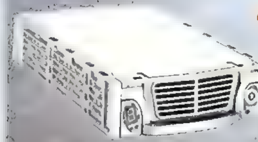
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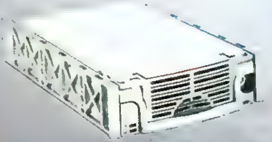
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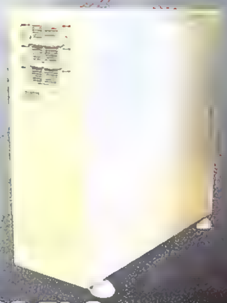
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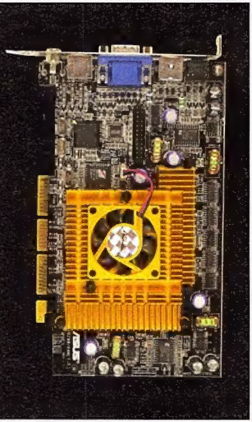
'Ever since S3 was sold, I can't get warranty support for my Trio'
'But I wannnnnnaaaaaaa GeForce3' (repeat ad infinitum)
'I only get 140 frames in Quake 3 with my current card'
'Everyone keeps talking about this Nature test in 3DMark2001, all I want to do is see it once'
'Not having a GeForce3 is an insult to the rest of my computer'
'But if I get a GeForce3 it'll mow the lawn FOR us'
'Look, you want a baby and so do I, it's just that the one I want has a programmable shader'
'I am dying of a terminal disease and the only thing that can cure me is a high frame rate'
'I can't think of a good name for Captain Atomic's sidekick'
'My GeForce 2 Ultra is soooo last year'
'I need one to get the highest 3DMark2001 score on madonion.com because then people will finally give me the respect I deserve'
'Everyone at school has one'
'I am allergic to jaggies, they make my eyes bleed'
'If I get one, you won't have to pretend you have a headache anymore'
'If I get a GeForce3 then I won't suck at CounterStrike'
'Starving children in Africa need my old video card'
'But the GeForce3 is the best video card ever and always will be'
'Having anything less is an offence in the eyes of god'

NAME THE SIDEKICK COMPETITION

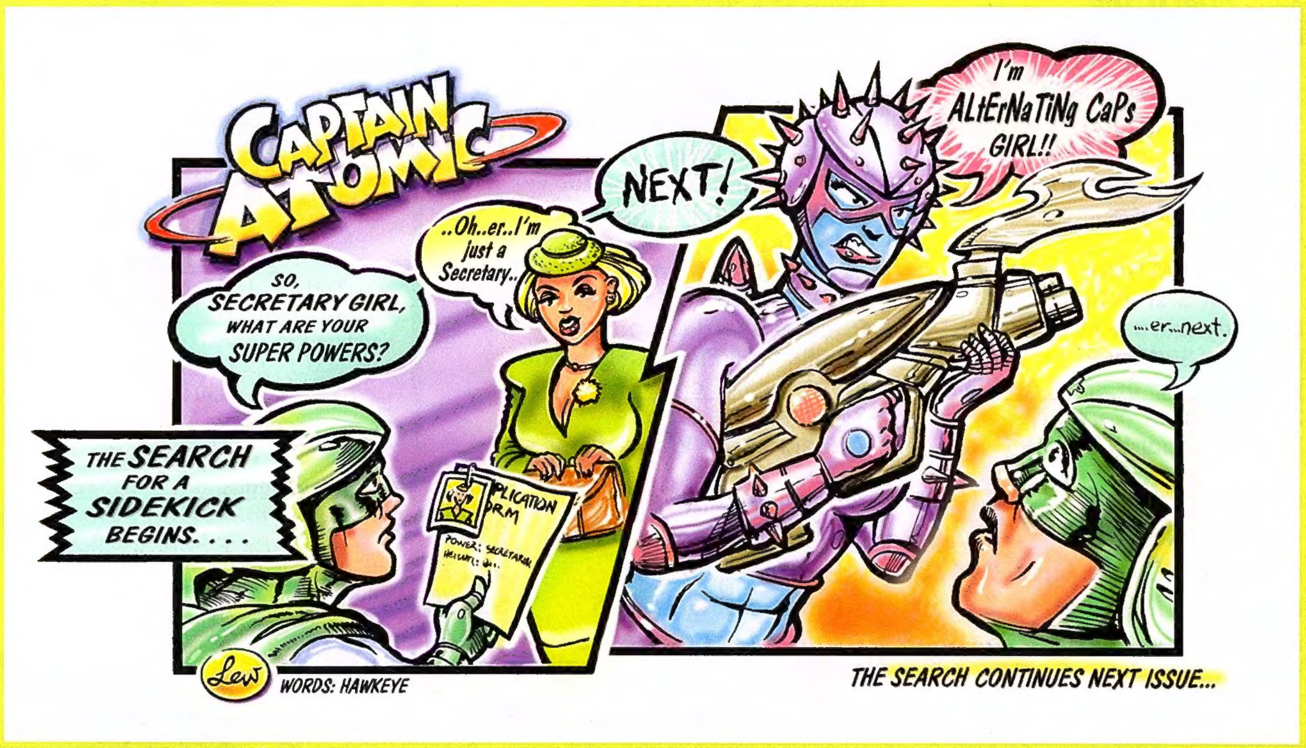


If you are still having trouble convincing people to buy you a GeForce3, don't worry there is another way. Being the 'people's superhero' it falls to you to come up with a name for Captain Atomic's new sexy, bitchin' female sidekick. The person who comes up with the smartest, funniest and just plain appropriate name will win the current jewel in the graphics card crown, the Asus V8200 Deluxe, thanks to Cassa (www.cassa.com.au). This GeForce3 powered beast not only pumps out the polygons at a phenomenal rate, but comes along with video in and out, 3D Glasses and 0.8 of a shitload of great software.

Not only will you be able to look fondly upon Captain Atomic each month and say 'I thought of that', but also you will be sitting on the business end of the fastest graphics card to ever hit the atomic labs. All you have to do is come up with a name. That's all.

Write this name, and your details, down on the back of an envelope and send it to
Bitchin' Sidekick, Atomic, PO Box 275, Beaconsfield, NSW 2014

Entries close on the 27th of June. The Judges decisions are final and no correspondence will be entered into.


CAPTAIN ATOMIC
SO, SECRETARY GIRL, WHAT ARE YOUR SUPER POWERS?
..Oh..er..I'm just a Secretary..
NEXT!
I'm ALtErNaTiNg CaPs GIRL!!
....er...next.
THE SEARCH FOR A SIDEKICK BEGINS....
PLICATION ORM
POWER: SECRETARIAL
Lew
WORDS: HAWKEYE
THE SEARCH CONTINUES NEXT ISSUE...

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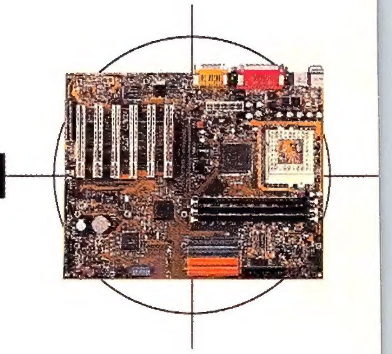
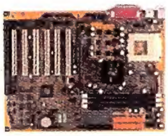


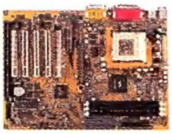
ST6-RAID

- Intel 815EP Chipset
- 4X AGP/ATA100
- Onboard Sound
- SoftMenu™ III
- RAID 0,1,0+1
- Universal M/B



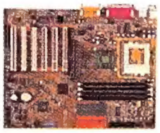
KT7A-RAID/KT7A

- VIA KT133A/686B
- ATA100/4X AGP
- SoftMenu™ III
- RAID 0,1,0+1(KT7A-RAID)



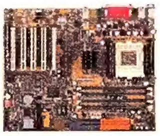
VH6T/VH6-II

- VIA 694X/686B
- ATA100/4X AGP
- SoftMenu™ III
- Universal M/B (VH6T)



ST6/SA6

- Intel 815EP Chipset
- ATA100/4X AGP
- SoftMenu™ III
- Universal M/B (ST6)



TH7-RAID

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